

DOCUMENT RESUME

ED 256 955

CE 041 533

TITLE Building Trades. Block IV. Wall Framing.
INSTITUTION Texas A and M Univ., College Station. Vocational Instructional Services.
SPONS AGENCY Texas Education Agency, Austin. Dept. of Occupational Education and Technology.
PUB DATE 85
NOTE 141p.; For related documents, see ED 235 104 and CE 041 532.
AVAILABLE FROM Vocational Instructional Services, Texas A and M University, F.E. Box 182, College Station, TX 77843.
PUB TYPE Guides - Classroom Use - Guides (For Teachers) (052)
EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Building Trades; *Carpentry; Classroom Techniques; *Construction (Process); Construction Materials; Course Content; Course Description; Curriculum; Educational Resources; Instructional Materials; Job Skills; Job Training; Learning Activities; Learning Modules; *Lesson Plans; Postsecondary Education; Secondary Education; Structural Elements (Construction); Teaching Methods; Trade and Industrial Education; Units of Study
IDENTIFIERS *Wall Framing

ABSTRACT

This document contains three units of a course on wall framing to be used as part of a building trades program. Each unit consists, first, of an informational lesson, with complete lesson plan for the teacher's use. Included in each lesson plan are the lesson aids; lists of teaching aids, materials, references, and prerequisites for students; techniques for learner motivation; complete step-by-step lesson presentation; applications; evaluation check list; summary; and suggested reading for students. Each unit also contains information sheets with line drawings, assignment sheets, one or several complete instructor's lesson plans (similar to the instructional lesson plan) for a manipulative lesson, job sheets, and task sheets. Topics covered include the following: types of wall framing and parts of wall frames, sole plate installation, types and construction of corner posts, construction of partitions, construction of headers, wall bracing, and wall frame construction.
(KC)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

TX 8413301

BUILDING TRADES

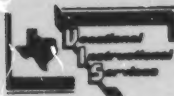
BLOCK IV

"WALL FRAMING"

DEVELOPED

BY

VOCATIONAL INSTRUCTIONAL SERVICES
VOCATIONAL INDUSTRIAL EDUCATION



IN COOPERATION WITH
TEXAS EDUCATION AGENCY
OCCUPATIONAL EDUCATION AND TECHNOLOGY
VOCATIONAL INDUSTRIAL EDUCATION

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

- This document has been reproduced as received from the person or organization originating it.
- ☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

(Printed 1985)

"PERMISSION TO REPRODUCE THIS
MATERIAL IN MICROFORM ONLY
HAS BEEN GRANTED BY

F. Page

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

ED256955

CE04/533

Available From
VOCATIONAL INSTRUCTIONAL SERVICES
VOCATIONAL INDUSTRIAL EDUCATION
F. E. BOX 182
TEXAS A & M UNIVERSITY
COLLEGE STATION, TEXAS 77843

All Rights Reserved
by
Vocational Instructional Services
Texas A & M University

MAJOR BLOCK IV - WALL FRAMING

TABLE OF CONTENTS

IV-A-1(I)	Types of Wall Framing; Parts of Wall Frame-----	1
IV-A-1(IS)	Wall Framing Methods, Techniques, Components-----	9
IV-A-2(I)	Sole Plates-----	15
IV-A-2(IS)	Sole Plate Installation-----	23
IV-A-1(S)	Install Sole Plates-----	29
IV-A-1(J)	Install Sole Plates-----	35
IV-A-1(TS)	Mark Foundation/Subfloor for Sole Plates (Outside Walls)	37
IV-A-1a(TS)	Mark Foundation/Subfloor for Sole Plates (Inside Walls)	39
IV-A-1b(TS)	Position; Cut Sole Plates to Length-----	41
IV-A-1c(TS)	Align Anchor Bolts-----	43
IV-A-1d(TS)	Drill Anchor Bolt Holes-----	45
IV-A-1e(TS)	Install Moiststop (Slab Construction)-----	47
IV-A-1f(TS)	Secure Sole Plates-----	49
IV-A-2(S)	Lay Out and Mark Sole and Single Top Plate-----	51
IV-A-2(J)	Lay Out and Mark Sole and Top Plates-----	55
IV-A-2(TS)	Position Top Plate-----	57
IV-A-2a(TS)	Mark Door Openings-----	59
IV-A-2b(TS)	Mark Window Openings-----	61
IV-A-2c(TS)	Mark Partitions-----	63
IV-A-2d(TS)	Mark Corner Posts-----	65
IV-A-2e(TS)	Mark Regular Studs, Cripple Studs-----	67
IV-B-1(I)	Corner Posts, Types and Construction-----	69
IV-B-1(IS)	Prefabricated Wall Frame Components--Platform Framing-	75
IV-B-2(I)	Partition "T"s, Types and Construction-----	83
IV-B-3(I)	Headers, Types and Construction-----	89
IV-B-1(S)	Construct Corner Posts-----	93
IV-B-1(J)	Construct Corner Posts-----	97
IV-B-1(TS)	Construct Corner Post (Type A)-----	99
IV-B-1a(TS)	Construct Corner Post (Type B)-----	101
IV-B-2(S)	Construct Partition "T"-----	103
IV-B-2(J)	Construct Partition "T"-----	107
IV-B-2(TS)	Construct Single Partition "T"-----	109
IV-B-2a(TS)	Construct Double Partition "T"-----	111
IV-B-3(S)	Construct and Install Solid Header-----	113

IV-B-3(J)	Construct and Install Solid Header-----	117
IV-B-3(TS)	Construct Solid Header-----	119
IV-B-3a(TS)	Install Solid Header in Wall Frame Assembly-----	121
IV-C-1(I)	Wall Bracing-----	123
IV-C-1(TS)	Wall Bracing-----	129
IV-C-1(S)	Install Let-in Braces--Platform Wall Frame-----	133
IV-C-1(J)	Install Let-in Brace-----	137
IV-C-1(TS)	Check, Square Wall Frame-----	139
IV-C-1a(TS)	Lay Out Brace and Mark for Gains-----	141
IV-C-1b(TS)	Cut Gains and Install Brace-----	143
IV-C-2(I)	Wall Frame Construction/Erection Procedures-----	145
IV-C-2(S)	Plumb, Temporarily Brace or Tie Wall Frame-----	153
IV-C-3(I)	Double Top Plates-----	159
IV-C-3(AS)	Double Top Installation-----	163
IV-C-3(S)	Install Double Top Plates-----	165
IV-C-3(J)	Install Double Top Plates-----	169

BLOCK I - WALL FRAMING

REFERENCES

Durbahn, Walter E., and Sundberg, Elmer W., Fundamentals of Carpentry, American Technical Society, Chicago, IL 60637

Feirer, John L., and Hutchings, Gilbert R., Guide To Residential Construction, Bennett Publishing Company, Peoria, IL 61615

Feirer, John L., Woodworking For Industry, Bennett Publishing Company, Peoria, IL 61615

Huth, Mark, Introduction To Construction, Delmar Publishers, Inc., 50 Wolf Road, Albany, NY 12205

Jones, Raymond P., and Ball, John E., Framing, Sheathing And Insulation, Delmar Publishers, Inc., 50 Wolf Road, Albany, NY 12205

*Wagner, Willis H., Modern Carpentry, The Goodheart-Willcox Co., Inc., South Holland, IL 60473

* State Adopted Text - V.I.E. Building Construction Trades

INSTRUCTOR'S PLAN
INFORMATIONAL LESSON

IV-A-1(I)

SUBJECT: Types of Wall Framing; Parts of Wall Frame

AIM: The student(s) will be able to identify and compare types of framing as employed in the wall construction of modern homes and small commercial buildings.
The student(s) will further be able to identify the various wall frame components and explain their purpose and function.

TEACHING AIDS: Information Sheet IV-A-1(IS)

MATERIALS:

REFERENCES: Wagner, William H., Modern Carpentry, Unit 8
Jones/Ball, Framing, Sheathing and Insulation, Unit 10

PREREQUISITE The student must have successfully completed previous lessons:
EXPERIENCE OF I-D-1(I), Personal And General Shop Safety
THE LEARNER: I-A-1(I), Print Reading For Building Trades
III-A-1(I), Framing Lumber
III-B-1(I), Types of House Framing

I. PREPARATION (OF THE LEARNER - MOTIVATION)

Different types of house framing require different layout procedures and different methods of construction/erection. However, the purpose, function, and requirements of wall frame components remain the same. Exterior walls normally support the roof load and serve as a framework for attaching interior and exterior wall coverings. Interior walls serve mainly as room dividers, although they sometimes share the ceiling loads.

The walls of a wood frame house normally consist of top and bottom plates, studs, door and window frames, interior and exterior coverings, and insulation. The requirements for wall framing lumber are stiffness, nail-holding power, and freedom of warpage, and it should be easy to work. The type and grade is the same as that generally used in floor framing. As with floor framing, there are two major types of wall framing - platform and balloon. The platform method is the most used by builders throughout the United States and Canada in modern home construction. Whatever the type, the carpenter must study the plans for the building and have a thorough understanding of them before construction begins.

II. PRESENTATION (OF THE INFORMATION)

INSTRUCTIONAL TOPICS TEACHING POINTS	THINGS FOR STUDENTS TO DO THINGS FOR INSTRUCTOR TO DO OR SAY
A. Purpose of Wall Frames	1. Exterior walls - Support upper floor loads - Support ceiling/attic loads - Support roof loads - Serve as framework for attaching interior and exterior covering - Carry insulation

- 2. Interior walls
 - a. Serve mainly as room dividers
 - b. May aid in carrying ceiling loads
 - c. Carry vertical plumbing, wiring
- B. Types of Wall Framing

Note: Types are the same as wood frame construction for total home

 - 1. Balloon framing - older method
 - 2. Platform framing - presently most used
 - 3. Plank and beam - gaining popularity
- C. Characteristics
 - 1. Balloon framing
 - a. Both wall studs and first floor joists rest on sill
 - b. Studs, corner posts are continuous from sill to top (rafter) plate
 - c. Second floor joists rest on ribbon board let-in to inside edge of wall studs
 - d. Floor joists (all) are spiked to studs to support and tie the structure
 - 2. Platform framing
 - a. Floor frames are built as a platform at each level
 - b. Platforms are built to building lines
 - c. Wall frames are built upon floor frames one-story high
 - d. Each floor frame and wall frame are built separately
 - 3. Plank and beam framing
 - a. Uses fewer structural members
 - b. Members are heavier than conventional framing
 - c. Members are spaced farther apart
 - d. Characterized by exposed framing - planks (usually 2") laid over beams, supported by posts
- D. Advantages
 - 1. Balloon framing
 - a. Greater vertical stability
 - 1.) Lumber shrinks thru cross-section
 - 2.) Lumber used in cross-section minimized
 - 3.) Less shrinkage vertically
 - b. Easy installation of service pipes and wiring in walls between levels
 - 2. Platform framing
 - a. Utilizes standard materials
 - 1.) More readily available
 - 2.) Costs less
 - b. Provides convenient work area
 - 1.) High safety factor
 - 2.) Requires little/no scaffolding
 - 3.) Allows prefabrication of wall sections

3. Plank and beam framing
 - a. Requires fewer pieces of material
 - b. Can be completed with fewer working hours
 - c. Exposed framing:
 - 1.) Presents effect of spaciousness
 - 2.) Employs beauty of natural wood grain

E. Disadvantages

1. Balloon framing
 - a. Quality studs at lengths required are often a premium; costs are greater
 - b. Construction/erection time greater
 - 1.) Wall sections cannot be prefabricated
 - 2.) Greater erection time
 - 3.) Requires much scaffolding; bracing
 - 4.) Draftstops, firestops must be added
2. Platform framing has no appreciable disadvantages
3. Plank and beam framing
 - a. Cost of materials high
 - b. Lengths and weights of materials often difficult to handle

F. Parts of Wall Frame

1. Sole Plate

1. Identify
2. Point out
3. Compare framing types
4. Discuss construction/erection procedures

1. Horizontal framing member at bottom of wall frame
2. Carries bottom end of studs - other vertical wall frame members
3. Serves to tie wall frame to floor

2. Top Plate

1. Horizontal frame member at the top of the wall frame
2. Serves to tie the top of the wall frame together

3. Double Top Plate

1. Also called rafter plate
2. Serves to stiffen wall sections
3. Serves to tie wall sections and partitions at the top

4. Studs (full)

1. Main vertical wall frame components
2. Spaced consistently regardless of openings in wall frame
3. Regularly spaced 16" O.C.

5. Trimmer Studs

1. Used in conjunction (nailed to) full studs
2. Used at door/window openings
3. Foreshortened stud, each side of opening
4. Supports header (top of framed opening)

II. PRESENTATION (CONT'.)

IV-A-1(I)

- | | |
|----------------------------------|---|
| 6. Cripple Studs | <ol style="list-style-type: none">1. Shortened studs2. Above/below framed wall openings3. Set on regular stud spacing |
| 7. Headers | <ol style="list-style-type: none">1. Horizontal framing members2. Over doors, windows, fireplaces3. Supports roof and ceiling loads over wall openings4. Several sizes, types - according to span; according to load<ol style="list-style-type: none">a. Built-up header-two pieces of 2" material nailed togetherb. Trussed headerc. Box beam header5. Prefabricated before erection |
| 8. Sill, Single And Double | <ol style="list-style-type: none">1. Horizontal frame member2. Bottom of window openings3. Single sill usually spiked to trimmers and cripple studs4. Double sill face nailed to single sill |
| 9. Corner Posts | <ol style="list-style-type: none">1. Vertical framing member at corners2. Prefabricated before erection3. Several types<ol style="list-style-type: none">a. Show examplesb. Discuss construction |
| 10. Partition "T"s | <ol style="list-style-type: none">1. Vertical framing members at junction of walls2. May be partially fabricated before erection3. Several types<ol style="list-style-type: none">a. Show examplesb. Discuss construction |
| 11. Partition Crosses | <ol style="list-style-type: none">1. Vertical framing members - seldom used2. Employed at intersection of walls<ol style="list-style-type: none">a. Show examplesb. Discuss construction |
| 12. Bracing | <ol style="list-style-type: none">1. Types<ol style="list-style-type: none">a. Let-inb. Set-inc. Plywood sheathing2. Show examples of each3. Discuss construction |
| G. Special Wall Frame Components | <ol style="list-style-type: none">1. List and show examples<ol style="list-style-type: none">a. Chase walls for plumbing dropsb. Bathtub supportsc. Framing small wall opening for heating ducts; ventsd. Blocking for hanging plumbing fixtures |

H. General Wall Framing
Procedure-Platform
Framing

- e. Cabinet soffits and backing
- f. Wall and ceiling nailers
- 1. Study the plans for the building
 - a. Have a thorough understanding of details
 - b. Be aware of special framing requirements
- 2. Lay out wall locations
 - a. Use steel tape
 - b. Measure accurately
 - c. Snap chalklines
 - d. Mark "X" on sole side
- 3. Install sole plates
 - a. Along main side walls first
 - b. Along end walls second
 - c. Interior walls/partitions third
- 4. Lay out sole plate/single top plate
 - a. Lay out door/window openings
 - b. Lay out partitions
 - c. Lay out corners; stud locations
- 5. Prefabricate wall components
 - a. Corner posts (partial)
 - b. Partition "T"s (partial)
 - c. Headers
 - d. Calculate; cut trimmers, cripples, window sills to length square
 - e. Nail trimmers to full studs
- 6. Assemble wall sections
 - a. One wall at-a-time
 - b. In same order as "install sole plates"
 - c. Position and assemble wall frame on floor
 - d. Inside of and square to marks on sole plate
- Note: Keep edges of wall frame components flush during assembly
- 7. Raise wall frame into position
- 8. Position frame components to marks on sole
- 9. Secure components to sole
- 10. Plumb and temporarily brace wall frame sections
- Note: As wall sections are completed
- 11. Tie wall sections together by nailing together;
 - a. Corner posts
 - b. Partition "T"s
- 12. Re-plumb corners; straighten plumb brace walls
- 13. Install double top plate
 - a. Lap corners; wall intersections
 - b. Stagger joints

III. APPLICATION (DRILL, ILLUSTRATIONS, ANALOGIES, ORAL QUESTIONS, OR ASSIGNMENTS, MAKING INVESTIGATIONS OR EXPERIMENTS, NOTE TAKING, MAKING SKETCHES, PARTICIPATING IN DISCUSSION.)

Class discussion

Identify and compare types of house framing

Identify wall frame components by name

Explain purpose and function of wall frame components

Compare wall frame components in major types of framing

List general sequence involved in constructing/erecting wall frames using platform method of framing

IV. VERIFICATION AND/OR EVALUATION (FINAL CHECK ON STUDENT'S COMPREHENSION OF MATERIALS PRESENTED.)

Simple Recall:

1. Requirements for wall framing lumber are stiffness, nail holding power, and freedom of warpage, and it should be _____. easy to work
2. Main purposes of exterior wall frames are to support the roof loads; serve as base for attaching _____. wall covering
3. The lowest member of the wall frame is called the _____. sole plate
4. The main vertical members of wall frames are called _____. studs
5. The horizontal framing member over a door or window is called a/an _____. header
6. The horizontal framing member over a door or window sits on a foreshortened stud called a/an _____. trimmer
7. The lower horizontal frame member for a window opening is referred to as a rough _____. sill
8. Shortened studs between wall openings and plates are called _____. cripples
9. Another name for double top plate is _____ plate. rafter
10. Prefabricated framework at the juncture of an exterior wall and an interior wall is called a/an _____. partition "T"
11. The most popular type framing in modern home construction today is _____ framing. platform
12. 1 x 4 diagonal braces let-in to the outside edge of the framework is called _____ bracing. let-in
13. In balloon framing, second floor joists rest on a/an _____ board. ribbon

IV. VERIFICATION (CONT'.)

IV-A-1(I)

14. Type framing which uses fewer, heavier structural members spaced farther apart is ____ framing.

plank and
beam

15. The first step in wall framing is ____.

study building
plans

V. SUMMARY (GIVE A BRIEF ACCOUNT OF EACH TOPIC REEMPHASIZING THE IMPORTANT POINTS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENT.)

Two major types of framing: balloon framing; platform framing.

Either may be built on pier and beam, wall, or slab foundations.

Balloon framing is characterized by full length studs which reach from the sill plate to rafter plate. Second floor joists rest on ribbon plates let-in to inside of studs, and the ends of the floor joists are spiked to studs to support and tie structure. Balloon framing requires extensive use of scaffolds and ladders in its construction/erection process.

Platform framing is the most popular method of house framing used in modern home construction today. The floor frame is constructed separately from the walls and serves as a safe work surface on which wall frames one-story high are constructed. Wall sections can be, and often are, assembled on the floor, then erected, positioned, and secured.

Exterior walls normally support the roof and ceiling loads. Interior walls act as room dividers and sometimes share the ceiling loads. Both exterior and interior walls serve as framework for attaching wall coverings.

Wall frames generally consist of top and bottom plates, studs, and door and window frames which include headers, sills, trimmer, and cripple studs and braces. Requirements of framing lumber are stiffness, nail-holding power, and freedom of warpage, and it should be easy to work.

The first step in wall framing - all framing - is to study the plans. Have a thorough understanding of the details and be aware of any special framing requirements.

SUGGESTED READING FOR STUDENTS:

Modern Carpentry, Unit 8
Guide to Residential Carpentry, Unit 14

THE NEXT LESSON IS: IV-A-2(I), "Sole Plates"

INFORMATION SHEET
ON
WALL FRAMING

IV-A-1 (IS)

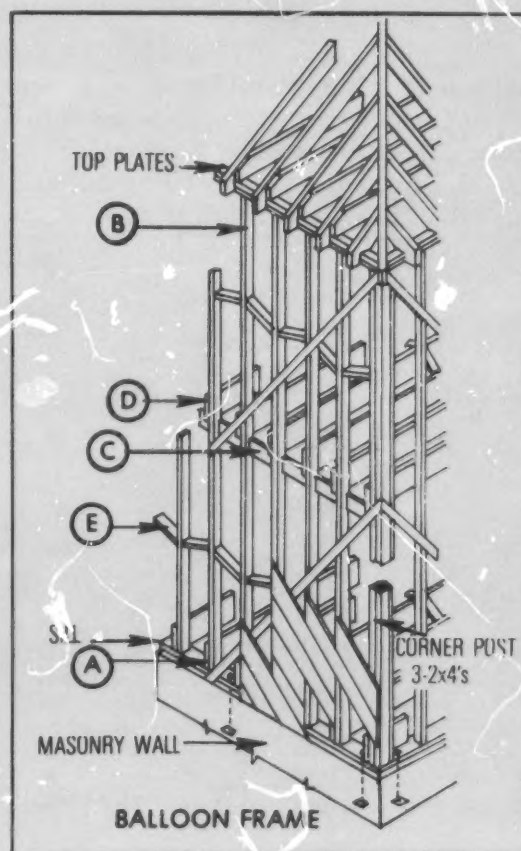
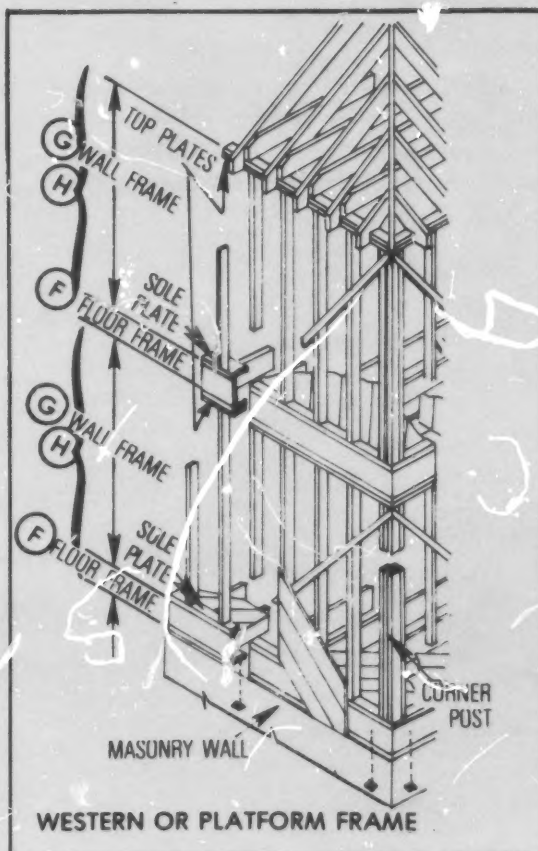
SUBJECT: Wall Framing Methods, Techniques, Components

INTRODUCTORY
INFORMATION:

There are two major types of conventional, or multi-member wall framing, as there are two types of conventional house framing. These are balloon framing and platform framing.

Balloon framing is identified by the following characteristics:

- A. Both wall studs and first floor joists rest on the sill.
- B. Studs and corner posts are continuous from the sill to the top plates.
- C. Upper floor joists are supported by a ribbon board let-in to the inside edge of the wall studs.
- D. Floor joists (all) are spiked to the studs to tie and support the structure.
- E. Method requires the installation of firestop and draftstop headers.



Platform framing, also called "Western" framing, is characterized as follows:

- F. Floor frames are built as a platform at each level.
- G. These platforms are built to the building lines and provide a base on which to construct wall sections one-story high.
- H. Each floor is framed separately.

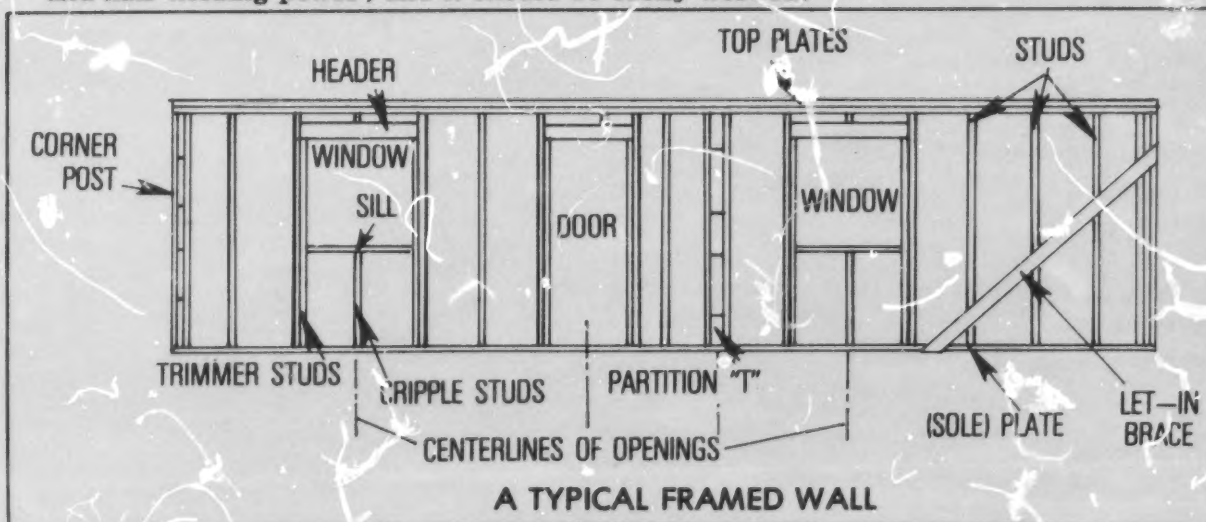
Both types of framing may be constructed on pier and beam foundations, wall foundations, or concrete slab foundations.

Platform framing is the most popular method of framing today. It is used almost exclusively by modern homebuilders throughout the United States and Canada, primarily because it lends itself to the availability of today's framing materials; it has a built in safety feature - the platform at each framing level; it requires fewer scaffolds, braces, and less erection time, making it more economical; and it may be employed in a variety of architectural designs.

For these reasons, this information sheet will concentrate on platform framing.

GENERAL INFORMATION:

In platform framing, the floor frame is complete before wall framing begins. A typical wall frame consists of the bottom and top plates, studs, door and/or window frames and bracing. It is generally constructed of 2 x 4 material with the studs spaced 16" O.C. The requirements for framing lumber are stiffness, freedom of warpage, and nail-holding power, and it should be easily worked.



Construction Sequence

There are several procedures that can be used to frame wall sections in platform

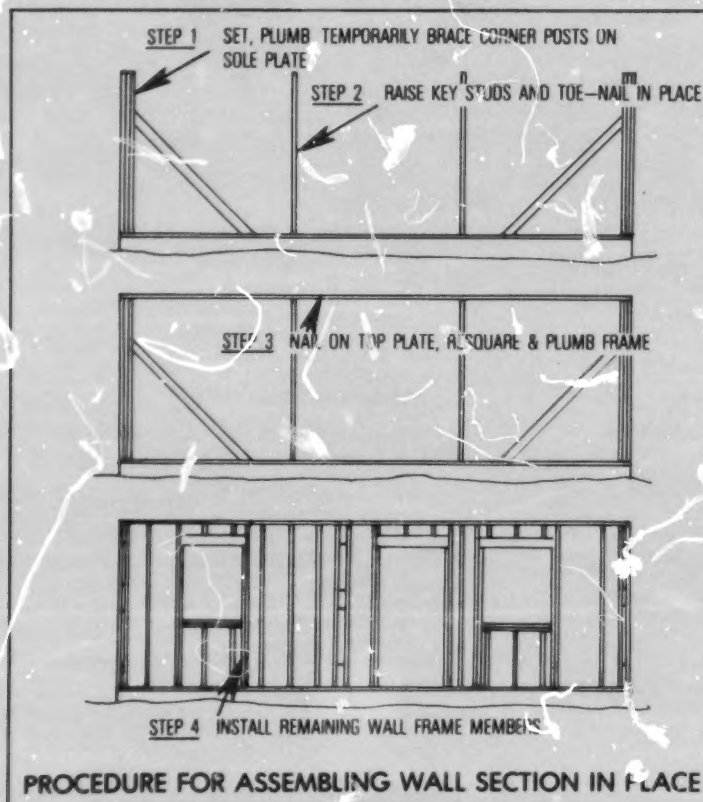
framing. Whichever method is used, the order, or sequence, in which they are constructed/erected should first be determined. Usually, the longer exterior walls are constructed/erected first. The shorter exterior walls are then erected in between. The interior walls are erected second in a similar order - the longer, main interior walls first, followed by shorter wall sections in between. This order/sequence of wall construction is generally maintained from plate layout through final wall construction.

Construction/Erection Procedures

The first step in wall framing is to lay out wall/plate locations on the subfloor. Study the floor plans and make accurate layouts. Remember! Accuracy of layout is most important to the final overall quality of a building.

There are several procedures/methods used to construct/erect wall sections in platform framing. The method used may be dictated by job conditions - length of wall, sequence of erection, how anchored, amount of help available, job expedience - procedure that best meets the particular situation - and, to some extent, the builder's preference.

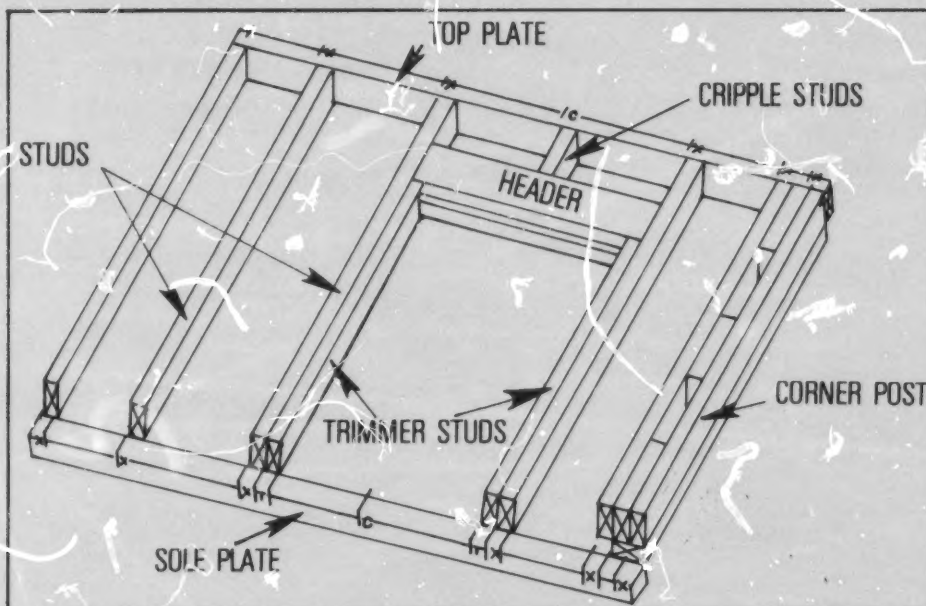
Assembling Wall Sections In Place



First, the carpenters set and temporarily brace the corner posts on the sole plate. Then they may raise key studs and toenail them in place. Next, they nail on the top plate. The frame is then checked, squared, replumbed, and rebraced as required, and the remaining wall members are installed.

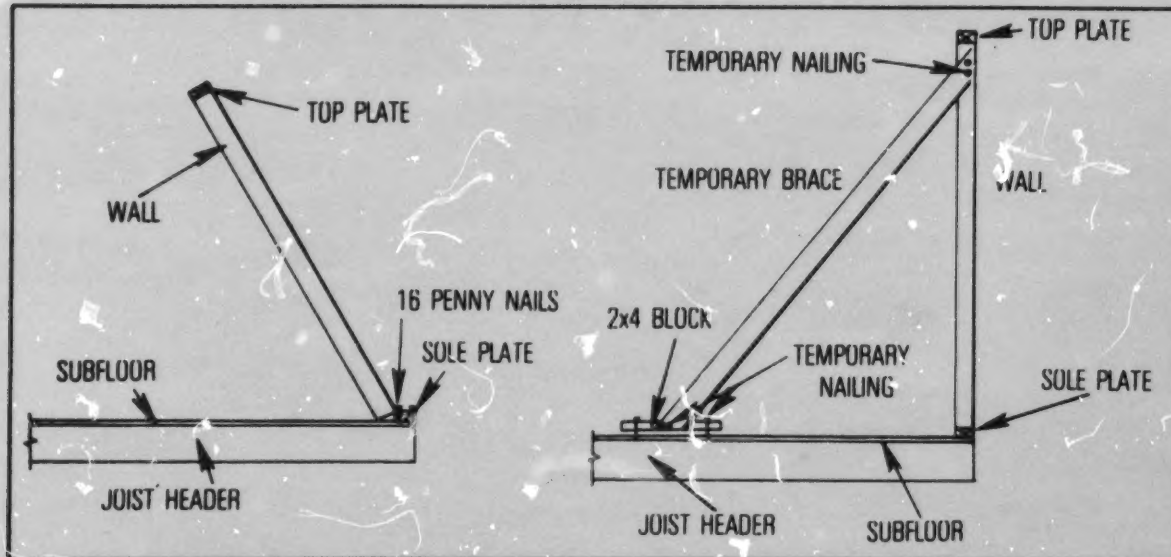
Assembling Wall Sections On The Subfloor

In a very different procedure, the wall members are laid out and assembled on the subfloor. The studs and other framing members are all cut to length and distributed to the area on the subfloor where they will be assembled. The premarked top plate is removed from its temporary nailing and placed on edge about 8'-0 in from the sole plate, with the marks facing the sole plate.



The studs are placed on edge between, and 90° to, the plates; with the ends of the studs to the marks on the plates. Corners and partitions are placed similarly at their marked locations. Starting at one end of the top plate, these members are nailed at their marked locations with (2) 16d nails driven thru the top plate into each member. Care should be exercised to keep the edges of each member flush to the edge of the top plate. Trimmers are positioned to studs at appropriate marks and nailed to adjacent studs if not previously assembled. Headers, cripples, and sills are laid in and nailed to the framework.

The wall frame is now ready to be raised. Since the studs, cripples, trimmers, partitions, and corners are nailed to the top plate only, the bottom ends will all be loose.



As a team (several carpenters), push the loose ends up against the sole plate (permanently installed) and raise the wall section up and onto the plate in a vertical position. The wall frame is held in a vertical position while the framing members are positioned to their marks and temporary bracing is installed. Bottom ends of wall frame members are secured to the sole plate by toenailing.

In a second method of erecting wall sections on the subfloor, the sole plate is temporarily nailed in place during layout and the wall components are framed as before. At this point the temporary nails are removed and the sole plate is turned on edge, with marks to the framing members. The sole plate is then nailed to framing members in the same manner as the top plate. This method affords the additional step of squaring the frame and installing sheathing prior to raising the wall section. The wall section is then raised, positioned to marks on the subfloor, temporarily braced, and permanently secured to the subfloor using 16d nails.

**INSTRUCTOR'S PLAN
INFORMATIONAL LESSON**

IV-A-2(I)

SUBJECT: Sole Plates

AIM: The student(s) will be able to explain the sequence and procedures used to lay out and install the sole plates in a wood frame construction.

TEACHING AIDS: Information Sheet IV-A-2(IS)
Chalkboard

MATERIALS: Chalk, sample: treated 2 x 4, tube of polyseal

REFERENCES: Wagner, Willis H., Modern Carpentry, Unit 8
Feirer, John L., Guide To Residential Carpentry, Unit 14

PREREQUISITE EXPERIENCE OF THE LEARNER: The student(s) must have successfully completed Major Block III, Floor Framing. The student(s) must continue to display sincere interest in learning the building trades.

I. PREPARATION (OF THE LEARNER - MOTIVATION)

A typical wall frame (platform framing) consists of bottom and top plates; studs to include corners, partitions, cripples, trimmers; door and/or window frames; and braces. This type wall frame can be constructed equally well on either concrete slab or wood frame floor. Several methods of assembly/erection of platform wall frames are available - any, all, may be pursued depending on the job circumstance, and, to some extent, the builder's preference. Whatever method is used, the first step is to lay out wall locations on the subfloor and set the sole plate, permanently or temporarily. Care must be taken to install the sole plate accurately and straight to insure a straight wall.

II. PRESENTATION (OF THE INFORMATION)

INSTRUCTIONAL TOPICS TEACHING POINTS	THINGS FOR STUDENTS TO DO THINGS FOR INSTRUCTOR TO DO OR SAY
A. Purpose of Sole	1. Carries the studs and other vertical framing members 2. Ties bottom of wall frame together 3. Ties the wall frame to the floor frame
B. Description of Sole	1. Lower horizontal wall frame member 2. Piece of material corresponding in width to wall frame
C. Sole Material	1. Framing lumber as per specifications 2. Sizes as per plan dimensions a. Usually 2 x 4s b. Chase walls, 2 x 6 c. Lengths vary - 14', 16' typical 3. Requirements a. Stiffness b. Freedom of warpage c. Nail-holding power d. Easily worked e. May be treated; especially on concrete

D. Sole Location

1. Lay out on subfloor
2. Use steel measuring tape; chalkline
3. Layout sequence
 - a. Longer exterior walls
 - b. Shorter exterior walls
 - c. Longer (main) interior walls
 - d. Shorter interior walls (connecting)

1. Exterior Walls

Note: Outside walls are generally set flush to outside of floor frame...on building lines as is the standard dimensioning practice of architects

1. Measure in $3\frac{1}{4}$ " (width of sole)
 - a. From outside edge of floor frame
 - b. At each end of wall section
 - c. One wall-at-a-time
2. Mark points measured
3. Mark inside edge of sole
 - a. With chalkline
 - b. Stretch through points marked
 - c. Snap chalkline on subfloor

2. Interior Walls

Note: Interior walls are also dimensioned from building lines, but may be dimensioned to edge of...or to the center of interior walls. When dimensioning to the edge of interior walls:

1. Measure in:
 - a. 90° from outside edge of floor frame
 - b. Distance indicated on floor plan
 - c. At each end of interior wall
2. Mark points measured
3. Mark side of sole plate
 - a. With chalkline
 - b. Stretch through points marked
 - c. Snap chalkline on subfloor
4. Mark "X" to denote actual location of sole

Note: When dimensioning to the center of interior walls, subtract $1\frac{3}{4}$ " (one-half the plate width) from the "locating dimension", follow the same procedure

E. Sole Placement

1. Follow same sequence as layout
 - a. Longer exterior walls (first)
 - b. Shorter exterior walls (in between)
 - c. Longer interior walls (first)
 - d. Shorter interior walls (connecting)
2. Start at one corner (end)
3. Ends square, flush with building lines
4. Plate straight, edge to chalkline

F. Sole Securing

5. End joints aligned over joists
 6. Corner joints, "T" joints butted tight
 7. Plates flat; level
1. Three methods
 - a. Anchor bolts
 - b. Concrete nails
 - c. 16d common nails
 2. Anchor bolts
 - a. Used in conjunction with concrete slabs
 - b. Generally used on exterior walls
 - c. Securing of sole plate with anchor bolts same/similar as sill plate. Review lesson III-A-1(S)
 3. Concrete nails
 - a. Used in conjunction with concrete slabs
 - b. Generally used on interior walls
 - c. Requires special pneumatic nailer gun to install; special instructions to operate
 - d. Nail shot staggered; 16"-18" apart
 4. 16d common nails
 - a. Used in conjunction with wood frame floors
 - b. Nailing pattern
 - 1.) (2) nails each joist sole crosses, or
 - 2.) (2) nails every two feet (when sole parallels joists)

Note: Insure a sufficient bead of polyseal or other weather sealant is placed between the sole plates and the subfloor before permanently securing the sole plates

G. Plate Layout For Wall Frames Components

1. Sole plate must be in position for layout
2. Top plate may be laid out at same time
 - a. Position top plate adjacent to sole plate
 - b. Temporarily nail in place
3. Order of layout
 - a. Doors/windows
 - b. Partitions
 - c. Studs

1. Lay Out Doors/Windows

1. Use steel tape, framing square, pencil
2. Start at appropriate corner of the building
3. Measure to center of door or window opening
 - a. Dimension indicated on floor plan
 - b. Along edge of plate

4. Mark distance with a line square across the plates
5. Mark line with a centerline symbol "C" and note door/window "schedule number"
6. Determine door/window "rough opening" (R.O.)
 - a. From door/window schedule
 - b. From manufacturer's instructions
7. Measure one-half R.O. each side of "C" and mark with lines square across plates
8. Mark "T" for trimmer just outside lines
9. Measure $1\frac{1}{2}$ " outside each of these lines and mark with lines square to the plates
10. Mark "X" for stud just outside these lines

2. Lay Out Partitions

1. Use steel tape, framing square, pencil
2. Start at appropriate corner of the building
3. Measure to the center of the partition
 - a. Dimension indicated on floor plan
 - b. Along edge of plate
4. Mark distance with a line square across plates
5. Mark line with a centerline symbol "C"
6. Measure $1\frac{3}{4}$ " each side of "C" and mark with lines square across plates
7. Mark "X" for stud just outside each of these lines

3. Lay Out Studs

1. Use a framing square and pencil
2. Start on left end (corner)
3. Position framing square
 - a. Face up
 - b. On top edge of plates
 - c. With tongue across plates
 - d. With $15\frac{1}{2}$ " dimension, inside blade, on end of plate (building line)
4. Mark lines square to plates both sides of tongue
5. Mark "X" for stud between lines
Note: Studs that fall within window/door openings, mark "C" for cripple stud
6. Slide square along plates
7. Align 16" dimension (inside blade) with first marked stud line
8. Mark lines square on plates both sides of tongue
Note: Continue marking studs on 16" intervals until wall is complete

III. APPLICATION (DRILL, ILLUSTRATIONS, ANALOGIES, ORAL QUESTIONS, OR ASSIGNMENTS, MAKING INVESTIGATIONS OR EXPERIMENTS, NOTE TAKING, MAKING SKETCHES, PARTICIPATING IN DISCUSSION.)

(Instructor provide floor plans for class project. Instructor ask questions; guide class discussion.)

Class discussion:

1. Type house framing used?
2. Type foundation used?
3. Locating and laying out walls
 - a. Sequence
 - b. Procedure
 - c. Dimensions
4. Installing the sole plate
 - a. Sequence
 - b. Procedure
 - c. Method of securing

IV. VERIFICATION AND/OR EVALUATION (FINAL CHECK ON STUDENT'S COMPREHENSION OF MATERIALS PRESENTED.)

Multiple Choice:

1. The first step in wall framing is to: a
 - a. lay out wall locations of subfloor.
 - b. cut framing members to length.
 - c. mark door and window openings.
 - d. sweep the subfloor clean.
2. Immediate responsibility of laying out wall locations belongs to the: a
 - a. carpenter.
 - b. job supervisor.
 - c. building contractor.
 - d. architect/designer.
3. Most important to the final overall quality of a building is the: c
 - a. architectural style.
 - b. method of construction.
 - c. accuracy of layout.
 - d. number of employees involved.
4. The first walls to be located and laid out on the subfloor are: b
 - a. chase walls.
 - b. longer interior walls.
 - c. longer interior walls.
 - d. fire walls.
5. Lines marking plate locations on the subfloor are best marked using a/an: d
 - a. straight edge.
 - b. framing square.
 - c. 2 x 4.
 - d. chalkline.
6. Interior walls are generally located from: a
 - a. building lines.
 - b. door centerlines.
 - c. window centerlines.
 - d. all of these.

IV. VERIFICATION (CON'T.)

IV-A-2(I)

7. Sole plates correspond in width to wall frames, generally 2 x 4, which are actually:
a. 3 1/4" wide. c. 3 3/4" wide.
b. 3 1/2" wide. d. 4" wide. b
8. When securing the sole to a wood subfloor (floor frame) use:
a. 6d common nails. c. 12d common nails.
b. 8d common nails. d. 16d common nails. d
9. The nailing pattern for securing a sole plate running parallel with the floor joists of a wood frame floor is:
a. stagger nails side to side 16" apart.
b. (2) nails every 2'-0.
c. (1) nail O.C. every 16".
d. (2) nails every 3'-0. b
10. Anchor bolt holes in sole plate should be drilled:
a. to size. c. 1/4" oversize.
b. 1/8" oversize. d. 1/2" oversize. c

V. SUMMARY (GIVE A BRIEF ACCOUNT OF EACH TOPIC REEMPHASIZING THE IMPORTANT POINTS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENT.)

The bottom member of a wall frame is the "sole" or sole plate. It lies horizontally on the subfloor and carries the studs and other vertical framing members. The sole serves to tie the bottom of the wall frame members together and ties the wall frame to the floor frame.

The first step in wall framing is to lay out wall plate locations on the subfloor. Follow this sequence! Lay out longer exterior walls first; lay out shorter (connecting) exterior walls second; third, lay out longer (main) interior walls; fourth, lay out shorter (connecting) interior walls. Measure from building line to edge of plate--each end of wall section, one wall-at-a-time. Mark the edge of plates with a chalkline stretched thru points measured and snapped on the subfloor. Mark an "X" on the appropriate side of the line to denote actual plate location. Remember accuracy of layout is most important to the final overall quality of a building.

Plate material, usually 2 x 4's, should be straight, free of major flaws, and have good nail holding qualities. Follow the same sequence in placing the sole. Start at one corner (end) - square end flush with the building line (floor frame). Lay plate straight with proper edge of the chalkline; end joints aligned over joists. Secure plates to wood floor frame with 16d common nails - (2) in each joist the sole crosses; (2) every two feet when sole parallels joists. Corner joints and "T" joints should butt tightly. When the sole plate is set on a concrete slab the exterior plates are generally secured by anchor bolts spaced approximately 4'-0 apart with a minimum of two bolts per wall section. The procedure is the same/similar as installing the sill plate on foundation walls. Review lesson III-A-1(S).

SUGGESTED READING FOR STUDENTS:

- Wagner, Willis H., Modern Carpentry, Unit 8

THE NEXT LESSON IS: IV-B-1(I), "Corner Posts, Types And Construction"

INFORMATION SHEET
ON
WALL FRAMING

IV-A-2 (IS)

SUBJECT: Sole Plate Installation

INTRODUCTORY
INFORMATION:

The sole plate is the bottom member of a wall frame in platform construction. It is a piece of material corresponding to the width of the wall frame (usually a 2 x 4) and is laid flat on the subfloor. This member carries the studs and other vertical framing members and ties the bottom of the wall frame together. The sole plates also serve to anchor the wall frames to the floor frame. Care must be taken to install the sole plates accurately and straight, thus insuring a straight wall.

GENERAL INFORMATION:

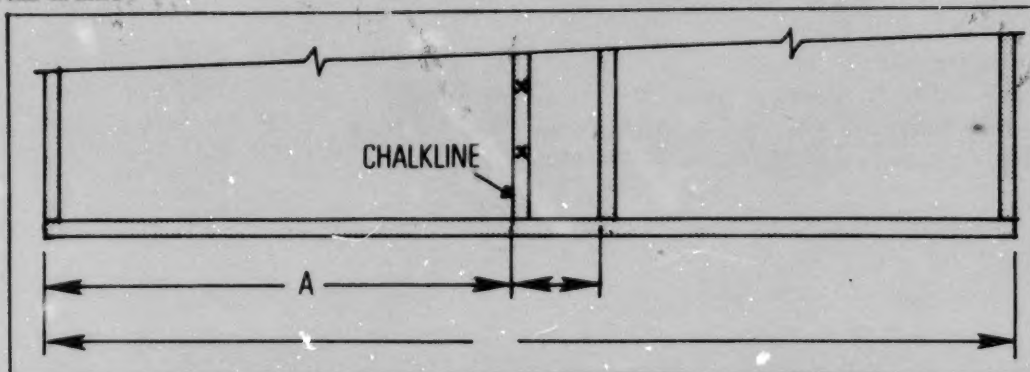
The first step in wall framing is to lay out wall (sole plate) locations on the subfloor. Since wall locations are laid out on the subfloor, floor framing must be complete before wall framing begins.

Locating Walls

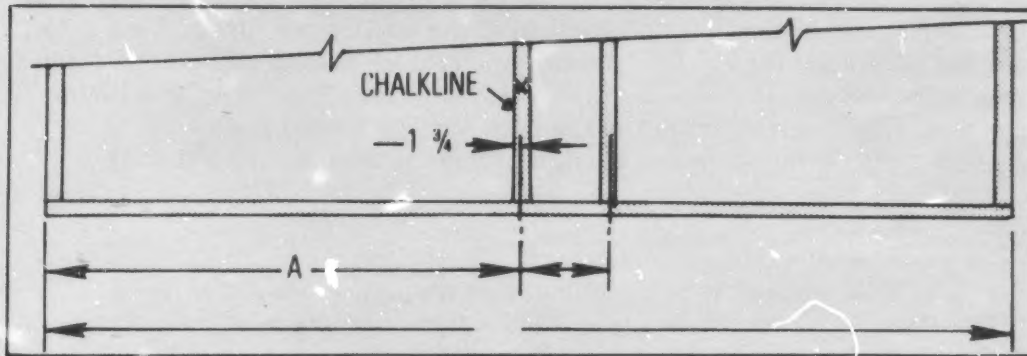
Determine the sequence of wall layout - longer outside walls first; shorter outside walls second; longer (main) interior walls third; and shorter (connecting) interior walls fourth.

The outside walls are generally set flush with the outside of the floor frame or ... on the building lines, as is the standard dimensioning practice of architects. Measure the width of the sole plate ($3\frac{1}{2}$ ") at each end of each outside wall, one-at-a-time, and mark the points measured. Stretch a chalkline taut between these points and snap a chalkline on the subfloor marking the inside edge of the sole plate.

Interior walls are also dimensioned from the building lines. However, these dimensions may be accumulative (several dimensions added together), and they may be dimensioned to either the edge of the wall frame or to the center of the wall frame.



If dimensioned from the building line to the edge of the interior wall frame, measure in 90° to the building line, the dimension indicated on the floor plan at each end of the interior wall. Mark points measured! Snap a chalkline on the subfloor between the points measured to mark the location of the edge of the plate. Mark an "X" on the appropriate side of the line to indicate the actual location of the plate.



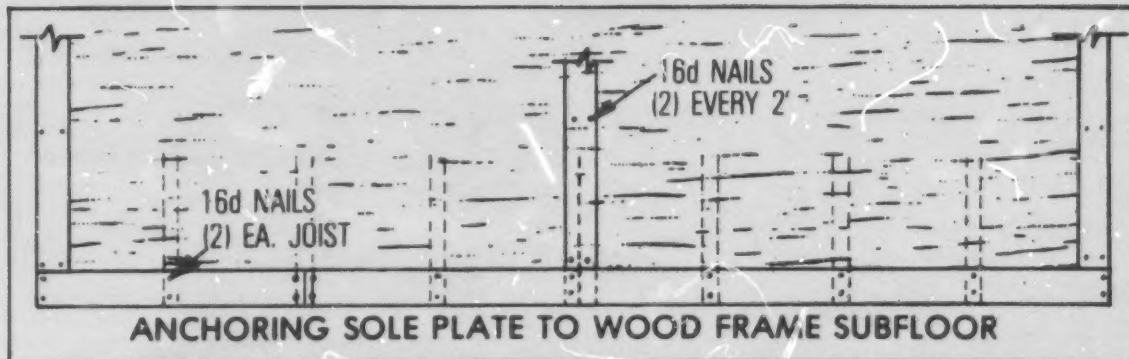
If dimensioned from the building line to the center of the interior wall, subtract 1 3/4" (one-half the sole width) from the locating dimension, and follow the same procedure as above.

Note: In place of a "X" to denote actual plate location, some carpenters prefer to mark both sides of the sole with a chalkline. If such is the case, locate the first line as above, add 3 1/2" (width of sole) and snap a second chalkline.
Double check and verify all wall layouts.

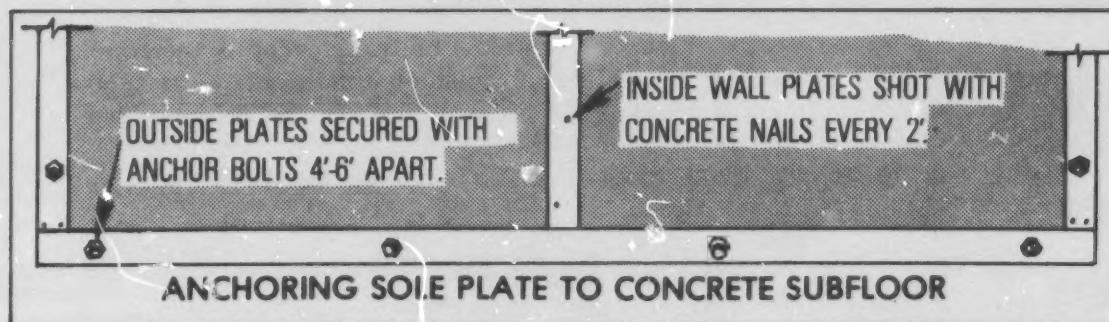
Placing And Securing Sole Plates

Placement of sole plates should follow the same sequence as layout - outside walls first; longer walls from building line to building lines; shorter walls in between. Start at one corner (end); square the end flush with building line. Lay plate straight with the inside edge to the chalkline on the subfloor; butt end joints tight and aligned over joists where applicable. As placement progresses, butt corner joints, "T" joints square and tight.

The sole plate may be secured by anchor bolts, shot with concrete nails, or nailed with 16d common nails depending on the type of subfloor, the building specifications, and the building procedures. The sole plate may be temporarily secured or permanently secured at the time of placement.



When securing a sole plate to a wood floor frame, use two nails at each joist it crosses. If the sole is laid lengthwise on top of a joist or girder, use two nails every two feet.

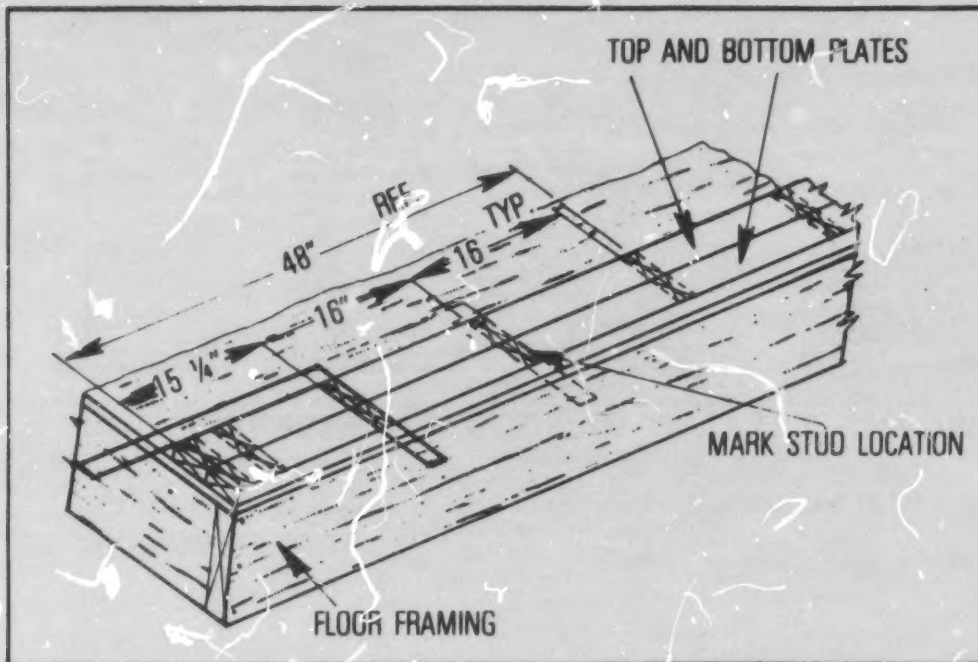


When securing a sole plate to a concrete slab (subfloor) using anchor bolts, the procedure is similar to installing a sill plate on foundation walls. Review lesson III-A-1(S).

Notes: On exterior walls, remember to run a sufficient bead of polyseal or other sealant to form a weathertight seal between the subfloor and the sole plate at time of plate installation. On exterior walls the sole should be continuous. The door openings are not cut until the wall is erected and permanently braced.

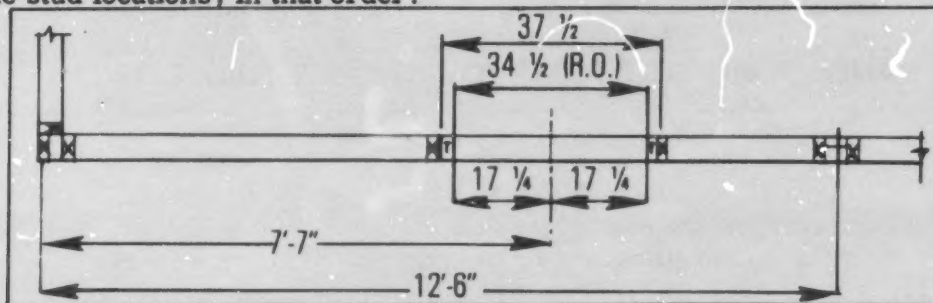
Laying Out Plates

The sole plate should be in position for layout purposes. The top plate can be laid out at the same time by temporarily nailing it adjacent to, or on top of, the sole plate.

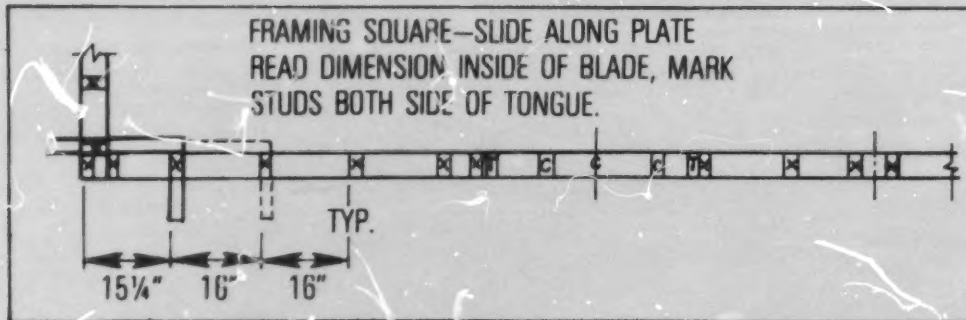


If nailed on top of the sole plate, layout marks must be transferred to the edges of the plates with a try square, and to the face of the sole after the plates are separated.

When laying out the plates, lay out the door and window openings, the partitions, and the stud locations, in that order.



To lay out door and window openings use a steel measuring tape. Measure from the appropriate building corner (building line) to the center of door or window as indicated on the floor plan. Mark the centerline on the plate(s) and note the door/window "schedule number". Determine the "rough opening" (R.O.) from the door/window schedule. Measure one-half the R.O. each side of the centerline and mark with lines square and normal to the sole. Mark a "T" for trimmer just outside these marks. Measure 1 1/2" and 3" outside each of these lines and again mark with lines square and normal to the sole. Mark an "X" between these lines for full studs.



To lay out regular stud spacing on the plates, a framing square may be handily employed to lay out and mark at the same time. Simply start at the left end and place the inside of the blade along the far edge of the plate with tongue lying across the top of the plate. Set the 15 1/4" mark inside the blade on the end of the plate and draw lines on the plate, each side of the tongue, square and normal to the plate. Slide the framing square along the plate until the 16" dimension, inside the blade, is aligned with the first mark previously made; again draw lines square and normal on the plate, each side of the tongue. Repeat this process until the wall section is laid out. Mark "X"s between lines for full studs. If a stud falls in the area of a door or window opening, mark a "C" between the lines for a cripple stud.

INSTRUCTOR'S PLAN
MANIPULATIVE LESSON

IV-A-1(S)

TASK:	Install Sole Plates
AIM:	The student will be able to mark foundation, and install sole plates in construction involving a concrete slab, or any type subflooring when the sole plate is installed on the subflooring in frame construction.
TOOLS AND EQUIPMENT:	6' rule, long tape, hand or power saw, extension cord, pencil, sawhorses, safety glasses, brace or electric drill, bit, staple gun, utility knife, caulking gun, sealant or canister of sealant, adjustable wrench, hammer or nailgun, chalkline, framing square, try square
MATERIALS:	Blueprints, 2" x 4" lumber, moiststop, sealant, nuts, washers, staples, nails, grout
TEACHING AIDS:	Same as tools, equipment, and materials
REFERENCES:	<u>Modern Carpentry</u> , Unit 5, pp. 71-86, Unit 7, pp. 119-121
PREREQUISITE EXPERIENCE OF THE LEARNER:	Students must be able to read blueprints, use framing square, hand or power saw, hand or power drill, use rule
CHECKING STANDARDS	1. Accuracy in measurements 2. Mark properly 3. Cut, position, and secure properly

I. PREPARATION (OF THE LEARNER - MOTIVATION)

Why is it necessary to mark the floor for the sole plates? Why is it necessary to secure the sole plate? Will the weight of the building hold it in place?

It is necessary to secure the sole plate to the foundation mostly due to the element of high wind. It is almost impossible for us to imagine the force that wind can sometimes exert. High winds can move the frame on the foundation of a house.

Also, securing the frame will strengthen the entire structure. In areas where earthquakes or earth slides occur, securing the frame to the foundation may keep them from separating. Therefore, the reason for securing the sole plates is to keep the building in its proper position.

II. PRESENTATION (OF THE SKILLS)

STEPS	KEY POINTS (THINGS TO REMEMBER TO DO OR SAY)
1. Establish Layout/Erection Sequence	1. Longer outside walls first 2. Shorter outside walls second 3. Longer (main) interior walls third 4. Shorter (connecting) interior walls fourth

II. PRESENTATION (CONT'.)

IV-A-1(S)

2. Lay Out Exterior Wall Plates
 1. On subfloor one-at-a-time
 2. Follow established sequence for layout
 - A. Measure
 1. Width of sole plate
 2. From building line in
 3. Each end of each outside wall
 4. Mark points with arrow
 - B. Mark Plate Line
 1. Draw chalkline taut
 2. Through points marked, each wall
 3. Snap chalkline clear and visible
 - Note: This line marks inside edge of sole plate
3. Lay Out Interior Wall Plates
 1. On subfloor one-at-a-time
 2. Follow established sequence for layout
 - A. Determine Dimensions
 1. From building line to centerline of interior wall or . . .
 2. From building line to edge of interior wall frame
 3. Length to interior wall
 - B. Measure Room Length
 1. From building line to interior wall as per blueprint
 2. Two places
 - a. Along adjacent building line
 - b. Along a line parallel to, and approximately interior wall length away from, first line
 3. Mark points measured with arrow
 - C. Mark Room Length
 1. Stretch chalkline through points marked
 2. Snap chalkline clear and visible
 - Note: If line just chalked denotes centerline of interior wall, follow step 2D. If line just chalked denotes edge of interior wall, follow step 2E.
 - D. Mark Interior Wall Plate
 1. Measure $\frac{1}{2}$ plate width
 2. Each side, each end of chalked centerline
 3. Mark points measured with arrow
 4. Stretch chalkline taut through points; each side of chalked centerline
 5. Snap chalkline marking edges of sole plates
 6. Mark "X"s between lines denoting plate area
 - E. Mark Interior Wall Plate (Alternate)
 1. Measure width of plate
 2. In direction as indicated on floor plan
 3. Each end of previous chalked line
 4. Mark points measured with arrow
 5. Stretch chalkline taut through points marked

- | | |
|---|---|
| | 7. Mark "X"s between lines denoting plate area |
| F. Measure Room Width | 1. From adjacent building line
2. To adjacent interior wall
3. Two places
a. Along outside building line
b. Along interior wall just marked
4. Mark points measured with arrow |
| G. Chalk Room Width | 1. Stretch chalkline through marked points
2. Snap chalkline to be clear and visible |
| H. Mark Interior Wall Plate | <u>Note: Follow same procedure as step 2D or 2E according to blueprint dimensions. Continue steps 2A thru H until all interior wall plates are marked on foundation</u> |
| 4. Select Sole Plate Material | 1. Straight and clear
2. Ends sound and square
3. Shorter lengths to extend over at least two anchor bolts |
| 5. Position Material | 1. Around outside walls, one-wall-at-time
2. Follow layout/erection sequence
3. Inside of plate aligned with chalkline |
| 6. Mark Plates For Length | 1. At points where material overlaps
2. Mark material square at points to be cut
3. Mark "X" on waste end |
| 7. Mark Plates For Plumbing | 1. Position framing square to inside of plate
2. With tongue across top of plate
3. Slide square along plate until tongue contacts plumbing
4. Back off $\frac{1}{4}$ " and mark line on top of plate
5. Repeat on opposite side of plumbing
6. Measure distance from chalkline to inside of plumbing, less $\frac{1}{4}$ "
7. Mark distance from inside of plate with a line between, and square to lines marked prior
8. Mark "X" in area of cutout (to the outside) |
| 8. Cut Plates To Length And To Receive Plumbing | 1. Place material on sawhorses
2. Waste material outside of sawhorses
3. Cut material square with line
4. Saw kerf in waste end of material |
| 9. Check Anchor Bolts For Vertical Alignment | 1. With try square
a. Place heel on foundation
b. Blade against bolt |

10. Align Anchor Bolt As Required
 2. Check for squareness
 - a. Two places, each bolt
 - b. 90° revolved
 1. Place nut on bolt
 2. Tap straight with hammer
 3. Remove nut
 4. Recheck alignment as in step #9
11. Mark Plates For Anchor Bolts
 1. Reposition plates as in step #5
Note: Follow procedure below at each anchor bolt
 2. Position framing square
 - a. Body to inside of sole plate
 - b. Tongue across sole plate
 - c. Tongue touching side of anchor bolt
 3. Draw lines square with plate and tangent to bolt
 - a. On top of plate
 - b. On each side of bolt
 4. Measure distance from chalkline (outside of plate) to inside of bolt + $\frac{1}{2}$ bolt diameter
 5. Mark bolt center distance on plate
 - a. From inside of plate
 - b. Between lines locating bolt
12. Drill Anchor Bolt Holes
 1. Place plates back on sawhorses
 2. Use drill bit 1/8" larger than anchor bolt
 3. Drill holes
 - a. On points marked
 - b. Vertically
13. Install Moiststop (Optional)
 1. To bottom of exterior sole plates
 2. Unroll approximately one yard of moiststop material
 3. Position flush with end of plate and along inside edge of plate
 4. Staple across end; 2 or 3 places
 5. Staple along sides, approximately 1 foot spacing
 6. Stagger staples from side to side
 7. Continue to unroll and staple keeping moiststop smooth, flat, and flush with inside edge
 8. Trim excess moiststop from outside edge of plate with utility knife
 9. Cut "X" in moiststop at each anchor bolt hole using utility knife
14. Apply Sealant And Secure Exterior Plates
 1. Position sole plate on anchor bolts
 2. Lift plate sufficiently and apply weatherproof sealant

II. PRESENTATION (CONT'.)

IV-A-1(S)

15. Secure Sole Plates (Without Anchor Bolts)

- a. In $\frac{1}{4}$ " wide, smooth bead
- b. On slab centered under plate
3. Press plate into position
4. Install washer and nut on each bolt
5. Align plate with chalkline
6. Tighten nuts firmly
- Note: Continue until all sole plates are installed, exterior and interior
7. Double check all work before proceeding to next job

Note: Some plans may not call for anchor bolts. In such cases, the following procedure is effective

1. Follow steps #1 through 8
2. Position sole plate
 - a. Ends flush with edge of foundation
 - b. Inside edge aligned with chalklines
3. Nail with 16d common nails
 - a. (2) each joist plate crosses or . . .
 - b. (2) every two feet
4. Nail with concrete nails
5. Hold nail gun straight and firm on plate
6. Shoot nails
 - a. 1" from sides of plate
 - b. Staggered from side to side
 - c. Approximately 16" apart

III. APPLICATION (PRACTICE BY LEARNER UNDER CLOSE SUPERVISION)

1. Students practice positioning and marking sole plates
2. Students practice cutting and drilling sole plates
3. Students practice applying moiststop and sealant
4. Students practice alignment to lines
5. Students practice bolting and nailing procedures

IV. VERIFICATION AND/OR EVALUATION (CHECK ON STUDENT'S ABILITY)

Give performance test

V. SUMMARY (TELL THE STEPS ON PROCEDURE AS TO WHAT, HOW, AND WHY. REVIEW CHECKING STANDARDS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENTS.)

1. Review steps to lesson
2. Explain why it is necessary to place the plate to line - not outside of foundation
3. Stress safety
4. Stress accuracy

SUGGESTED READING FOR STUDENTS:

Modern Carpentry, Unit 8, pp. 138-148

THE NEXT LESSON IS: IV-A-2(S), "Lay Out and Mark Single Top Plates"

JOB SHEET
IN
WALL FRAMING

IV-A-1(J)

JOB: Install Sole Plates

MATERIALS: Blueprints, 2" x 4" lumber, moiststop, sealant, nuts, washers, staples, nails, grout

TOOLS AND EQUIPMENT: 6' rule, long tape, hand or power saw, extension cord, pencil, sawhorses, safety glasses, brace or electric drill, bit, staple gun, utility knife, caulking gun, sealant or canister of sealant, adjustable wrench, hammer or nailgun, chalkline, framing square, try square

GENERAL INSTRUCTIONS: Modern Carpentry, Unit 5, pp. 71-86, Unit 7, pp. 119-121

PROCEDURES AND/OR TASKS:

IV-A-1(TS)	Mark Foundation For Sole Plates (Outside Walls)
IV-A-1a(TS)	Mark Foundation For Sole Plates (Inside Walls)
IV-A-1b(TS)	Position; Cut Sole Plates To Length
IV-A-1c(TS)	Align Anchor Bolts
IV-A-1d(TS)	Drill Anchor Bolt Holes
IV-A-1e(TS)	Install Moiststop (Slab Construction)
IV-A-1f(TS)	Secure Sole Plate

TASK SHEET

IV-A-1(TS)

TASK: Mark Foundation/Subfloor For Sole Plates (Outside Walls)
JOB: Install Sole Plates
TRADE: Building Trades
TOOLS AND MATERIALS: 6' rule, long tape, chalk box line, pencil, blueprints
TASK BREAKDOWN:

STEPS	KEY POINTS
1. Read Blueprints	1. Refer to floor plan for locations, dimensions 2. Refer to sections and details for wall dimensions
2. Measure	1. Width of sole plate 2. From outside building line, in 3. Each end of each outside wall Note: If foundation has masonry ledge, measure from inside of ledge
3. Mark	1. With arrow 2. Check for accuracy
4. Chalk Sole Plate Lines	1. Stretch chalkline taut 2. Through points marked each end; each wall 3. Snap chalkline clear and visible 4. Mark "X"s on plate side of lines

TASK SHEET

IV-A-1a(TS)

TASK: Mark Foundation/Subfloor For Sole Plates (Inside Walls)
 JOB: Install Sole Plates
 TRADE: Building Trades
 TOOLS AND MATERIALS: 6' rule, long tape, chalk box line, pencil blueprints
 TASK BREAKDOWN:

STEPS	KEY POINTS
1. Determine Dimensions	1. Read blueprints 2. Establish location of dimensions a. From building line to centerline of interior wall or . . . b. From building line to one edge of interior wall 3. Length of interior wall
2. Measure Length Of Room	1. From building line 2. To interior wall as per blueprint 3. Two places a. Along outside building line b. Along a line parallel to, and approximately interior wall length away from, first line 4. Mark points measured with arrow
3. Chalk Room Length	1. Stretch chalkline taut 2. Through points just marked 3. Snap line; to be clear and visible
4. Measure Width Of Room	1. From adjacent building line 2. To adjacent interior wall 3. Two places, similar to step 2
5. Chalk Width Of Room	1. Similar as in step 3 2. Lines to be clear and visible
CHECK POINT!	Check with instructor before proceeding, instructor to check layout and room dimensions
6. Mark Interior Wall Plates	Note: When locating dimension is to centerline of interior wall . . . 1. Measure $\frac{1}{2}$ plate width 2. Each side, each end of chalked centerline 3. Mark points measured with arrow 4. Stretch chalkline taut through points, each side of chalked centerline 5. Snap chalkline marking edges of sole plates

STEPS

KEY POINTS

6. Mark "X"s between lines identifying plate area
Note: When locating dimension is to edge of interior wall frame . . .
 1. Measure width of plate
 2. In direction as indicated on floor plan
 3. Each end of previous chalked lines
 4. Mark points measured with arrow
 5. Stretch chalkline taut through points marked
 6. Snap chalkline to be clear and visible
 7. Mark "X"s between lines indicating plate area
7. Proceed For All Walls
 1. Determine dimensions as per blueprint
 2. Perform steps 2 - 6Note: Some measurements may be made from interior wall lines

TASK SHEET

IV-A-1b(TS)

TASK: Position; Cut Sole Plates To Length
 JOB: Install Sole Plates
 TRADE: Building Trades
 TOOLS AND MATERIALS: Lumber for plates, 6' rule, long tape, framing square, sawhorse, pencils, power or hand saw, extension cord, safety goggles
 TASK BREAKDOWN:

STEPS	KEY POINTS
1. Select Material	1. To be straight and relatively clear 2. Ends to be square and sound 3. Lengths for minimal waste
2. Position Material	1. Outside edge of plate on chalklines 2. Ends on building line; door openings 3. So that shorter lengths will extend over at least two anchor bolts 4. So that material overlaps occur in the middle of a wall Note: Outside corners must overlap, inside corners must butt flush!
3. Mark Plates For Length	1. At points where materials lengths overlap 2. Mark line square to inside of plate 3. Place "X" on waste end
4. Mark Plates For Plumbing	1. Position framing square a. To inside of plate b. With tongue across top of plate 2. Slide framing square along plate until tongue contacts plumbing 3. Back off $\frac{1}{4}$ " and mark line on top of plate 4. Repeat on opposite side of plumbing 5. Measure distance from chalkline to inside of plumbing, less $\frac{1}{4}$ " 6. Mark distance from inside of plate between lines marked prior 7. Mark "X" in area to be cut out
CHECK POINT:	Double check position of plates and marks before making any cuts
5. Cut Plates	1. Place plates on sawhorses a. Check position of material/sawhorses to be sturdy b. Material to be cut off outside of sawhorses 2. Cut material square with line

STEPS

KEY POINTS

6. Reposition Plates

3. Saw kerf in waste part of material
Note: Continue steps 1 thru 4 for all
sole plates

1. On slab
2. In their respective positions

TASK SHEET

IV-A-1c(TS)

TASK: Align Anchor Bolts
JOB: Install Sole Plates
TRADE: Building Trades
TOOLS AND MATERIALS: Try square, nuts, hammer
TASK BREAKDOWN:

STEPS	KEY POINTS
1. Check Anchor Bolts For Vertical Alignment	1. With try square 2. Heel on foundation 3. Blade against bolt Note: Check 2 sides minimum; if not vertical proceed with step 2
2. Straighten Anchor Bolt	1. Place nut on bolt 2. Tap with hammer 3. Remove nut 4. Recheck vertical alignment Note: If bolt is not vertical with slab or foundation repeat key points 1 - 4. Bolts must be vertical

TASK SHEET

IV-A-1d(TS)

TASK: Drill Anchor Bolt Holes

JOB: Install Sole Plates

TRADE: Building Trade

TOOLS AND MATERIALS: 6' rule, framing square, pencil, plate material, brace or electric drill, bit, extension cord, 2 x 4 blocks

TASK BREAKDOWN:

STEPS	KEY POINTS
1. Check position Of Plate On Slab	1. In respect to position as laid out 2. With ends flush on building line; door openings 3. With outside edge of sole plate on chalkline
2. Mark Plate For Anchor Bolt Holes	1. Position framing square on plate a. Body of square to inside of plate b. Tongue of square across top of plate 2. Slide square along plate until tongue contacts side of anchor bolt 3. Draw line on plate tangent to anchor bolt 4. Repeat on opposite side of anchor bolt 5. Measure distance from chalkline to inside of anchor bolt 6. Add $\frac{1}{4}$ " to measurement 7. Mark distance from inside of plate a. Between lines tangent to anchor bolt b. With a line square to lines tangent 8. Locate and mark center distance between tangent lines <u>Note: Repeat steps #1 and 2, all anchor bolt locations</u>
3. Drill Anchor Bolt Holes	1. Place backing block(s) under holes to be drilled <u>Note: Backing blocks may be 2 x 4 scraps. Backing blocks must provide sturdy base</u> 2. Select drill bit $\frac{1}{8}$ " - $\frac{1}{4}$ " oversize (larger than anchor bolt) and install in drill or brace <u>Note: If using power drill follow proper safety procedures and cautions in set-up and operation</u> 3. Position and set bit on mark 4. Hold drill/brace in vertical position 5. Drill hole applying steady, even pressure <u>Note: Repeat step #3 all anchor bolt holes</u>

TASK SHEET

IV-A-1e(TS)

TASK: Install Moiststop (Slab Construction)
 JOB: Install Sole Plates
 TRADE: Building Trades
 TOOLS AND MATERIALS: Moiststop, utility knife, staple gun, staples, and sawhorse
 TASK BREAKDOWN:

STEPS	KEY POINTS
1. Position Sole Plates	1. Top of plate face down 2. To provide firm support for plate - On sawhorses - On foundation
2. Position Moiststop Material	1. End flush with end of plate 2. Edge flush with inside of plate 3. Unroll along plate as you secure
3. Secure Moiststop	1. Staple material near end of plate with 3, 3/8" staples 2. Staple 3/4" from edge as material is unrolled 3. Stagger staples from side to side, 12" - 16" apart
4. Trim Moiststop Material	1. Cut 4" longer than plate with utility knife <u>Note: Do not cut 4" strip off as it extends under adjoining plate</u> 2. Trim excess material off side of plate - With utility knife - Along side of plate
5. Cut Holes For Anchor Bolts	1. Cut "X" with utility knife 2. In moiststop material 3. Each anchor bolt hole

TASK SHEET

IV-A-1f(TS)

TASK: Secure Sole Plates
 JOB: Install Sole Plates
 TRADE: Building Trades
 TOOLS AND MATERIALS: Caulking gun, sealant, hammer, washers, nuts, wrench, precut and drill plates
 TASK BREAKDOWN:

STEPS	KEY POINTS
1. Position Sole Plate	1. On anchor bolts 2. In place as originally laid out
2. Install Washers And Nuts	1. Place washer on each anchor bolt 2. Start nut on each anchor bolt a. By hand b. 1 or 2 turns
3. Apply Sealant	1. Place spacer wedges between plate and slab for clearance 2. Place nozzle of caulking gun $\frac{1}{4}$ " under plate a. End of nozzle on slab b. At slight angle to slab 3. Apply $\frac{1}{4}$ " bead of sealant a. Evenly b. Full length of plate
4. Adjust Plate	1. Remove spacers 2. Press plate in place a. Inside of plate on chalkline b. Ends of plate flush with building line, door line, or abutted to adjoining plate
5. Tighten Nuts On Bolts	1. Using appropriate size, type wrench 2. Turn nut clockwise until snug <u>Note:</u> This should be done quickly before sealant sets. Sealant should appear along side of plate
CHECK POINT:	Double check plate alignment <u>Note:</u> Repeat steps #1 thru #5, all sole plates

INSTRUCTOR'S PLAN MANIPULATIVE LESSON

IV-A-2(S)

- TASK:** Lay Out And Mark Sole And Single Top Plates
- AIM:** The student will be able to correctly lay out and mark both plates for insertion of the various members of the stud wall.
- TOOLS AND EQUIPMENT:** Framing square, 6' rule, 50' - 100' tape, hand or power saw, pencil, sawhorse, safety goggles, extension cord, blueprint
- MATERIALS:** 2" x 4" lumber for plate
- REFERENCES:** Textbook, Modern Carpentry, Unit 5, pp. 71-86; Unit 7, pp. 135-148
- PREREQUISITE EXPERIENCE OF THE LEARNER:** Student must be able to read blueprint floor plan, framing plan, and window and door schedule. Must be able to read measurements and know how to apply square for marking. Must be able to work simple math.
- CHECKING STANDARDS:**
1. Accuracy in measurement
 2. Mark properly

I. PREPARATION (OF THE LEARNER - MOTIVATION)

1. Frame walls consist of several components. They consist of both horizontal and vertical members.
2. This lesson will cover layout of the vertical members on the horizontal member at the top and bottom of the wall.
3. Be accurate in all operations.

II. PRESENTATION (OF THE SKILLS)

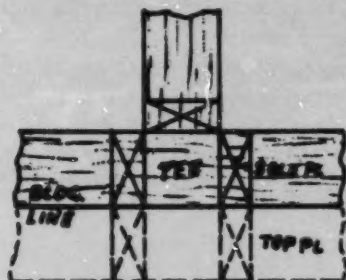
STEPS	KEY POINTS (THINGS TO REMEMBER TO DO OR SAY)
1. Select Material For Top Plate	1. Straight; free of warp 2. Good nail holding power 3. Sound, but easily worked
2. Position Plate	1. One wall-at-a-time 2. Adjacent to...on top of...sole plates 3. Ends flush with sole plates and/or building lines 4. Follow layout/erection sequence
3. Temporarily Secure Top Plate	1. By toenailing to sole plate with 8d nails 2. By facenailing to subfloor with duplex head nails
4. Lay Out And Mark Door Openings	1. Measure from appropriate building lines a. Dimensions indicated on the floor plans b. To the centerline of the door c. Along the outside edge of the sole plate

2. Mark the center with a line square and normal to the plates
 3. Mark centerline symbol "⊥" and label door "schedule number"
 4. Determine door "rough opening" (R.O.)
 - a. From door schedule
 - b. From manufacturer's instructions
 5. Measure $\frac{1}{2}$ rough opening, each side of door centerline
 6. Mark with lines square and normal to sole plate
 7. Mark "T" for trimmer on sole plate each side/outside of lines for R.O.
 8. Measure $1\frac{1}{2}$ " outside R.O. each side and mark lines square and normal to plate
 9. Mark "X" for full stud outside of these lines
5. Lay Out And Mark Window Openings
1. Determine dimensions
 - a. Refer to blueprint "floor plan" for locations
 - b. Refer to "window schedule" for sizes
 2. Measure to window centerline
 3. Mark centerline distance on sole plate with a line square to inside of plate
 4. Measure $\frac{1}{2}$ window "rough opening" each side of window centerline and mark with arrow
 5. Position framing square on sole plate
 - a. Body to inside edge of plate and pointing to window centerline
 - b. Tongue across plates with inside edge on mark; each side
 6. Mark lines on both sides of tongue square to both plates
 7. Mark "T" for trimmer between lines both plates
 8. Slide square out so that inside of tongue is on line just drawn to the outside of tongue
 9. Mark line on outside of tongue, square to both plates
 10. Mark "X" between 2nd and 3rd line, both plates
 11. Repeat keypoints #4 thru #10 above; opposite side of window

II. PRESENTATION (CONT'.)

IV-A-2(S)

6. Lay Out And Mark Partition "T"s



7. Lay Out And Mark Studs

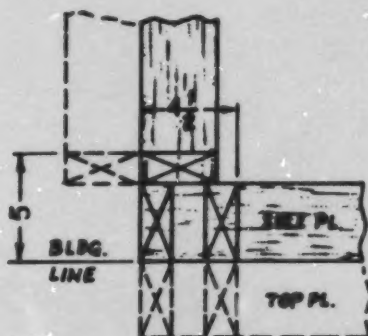
1. Measure from appropriate building lines
 - a. Dimensions as per floor plans
 - b. To center of partition wall
 - c. Along outside edge of plates
2. Mark center with a line square to plate
3. Measure $1 \frac{3}{4}$ " each side of center and mark with lines square and normal to plates
4. Mark "X" just outside each line for full stud
5. Measure $1 \frac{1}{2}$ " outside each of these lines and mark with lines square to plates

Note: Lay out and mark one wall at a time. Start at the front left corner of the building

1. Position framing square
 - a. Face up
 - b. Inside of body flush to inside of sole plate
 - c. Tongue across both plates
 - d. $15 \frac{1}{4}$ " mark on inside of body on building line
2. Mark lines on both sides of tongue, both plates
3. Mark "X" between lines, both plates
4. Move framing square along plate
5. Align 16 " mark on inside of body with 1st line
6. Mark lines on both sides of tongue
7. Mark "X" between lines both plates

Note: Studs within window openings mark "C" both plates. Studs within door opening mark "C" top plate only. Continue marking studs on 16 " intervals until wall is complete

8. Lay Out And Mark Outside Corner Posts



1. Measure $4 \frac{1}{4}$ " from outside building line
2. Along sole plate with end flush to said building line
3. Mark both plates with line square to inside of sole plate
4. Divide $4 \frac{1}{4}$ " length into (3) equal spaces of $1 \frac{1}{4}$ "
5. Mark both plates with lines square to inside of sole plate

II. PRESENTATION (CONT'.)

IV-A-2(S)

Note: This is easily done by placing body of framing square flush to inside edge of sole plate with tongue across plates. As tongue is $1\frac{1}{2}$ " wide, the inside edge may be placed on the line and the next line drawn to the outside edge

6. Mark "X" in 1st and 3rd spaces
7. Measure 5" from adjacent outside building line
8. Along adjacent sole plate
9. Mark both plates with a line square to inside of sole plate
10. Mark "X" between line and end of adjacent plates

III. APPLICATION (PRACTICE BY LEARNER UNDER CLOSE SUPERVISION)

Student practice positioning top plate

Student practice laying out and marking top and sole plate for various components

IV. SUMMARY (TELL THE STEPS ON PROCEDURE AS TO WHAT, HOW, AND WHY. REVIEW CHECKING STANDARDS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENTS.)

1. Review steps to lesson
2. Explain why it is necessary to lay out and mark components in an order
3. Stress safety
4. Stress accuracy

SUGGESTED READINGS FOR THE STUDENTS:

Modern Carpentry, Unit 5 and Unit 7

THE NEXT LESSON IS: IV-B-1(S)

"Construct Corner Post"

JOB SHEET

IV-A-2(J)

JOB: Lay Out And Mark Sole And Top Plates

MATERIALS: Blueprints, 2" x 4" lumber, nails

TOOLS AND EQUIPMENT: 6' rule, long tape, hand or power saw, extension cord, pencil, sawhorses, safety glasses, hammer, framing square

GENERAL INSTRUCTIONS: Modern Carpentry, Unit #5, pp. 71-86; Unit #7, pp. 135-148

PROCEDURES AND/OR TASKS:

IV-A-2(TS)	Position Top Plates
IV-A-2a(TS)	Mark Door Openings
IV-A-2b(TS)	Mark Window Openings
IV-A-2c(TS)	Mark Partitions (Tees)
IV-A-2d(TS)	Mark Corner Posts
IV-A-2e(TS)	Mark Regular Studs; Cripple Studs

TASK SHEET

IV-A-2(TS)

TASK: Position Top Plate
JOB: Lay Out And Mark Sole And Top Plates
TRADE: Building Trades
TOOLS AND MATERIALS: 2" x 4" lumber, framing square, saw or power saw, pencil, hammer, nails
TASK BREAKDOWN:

STEPS	KEY POINTS
1. Select Plate Material	1. To be straight and relatively clear 2. Ends to be square and sound 3. For minimal waste Note: Plates are same length. Joints in top plate must center over stud
2. Position Plate	1. Face down 2. Outside of sole plate 3. Adjacent to sole plate a. Ends flush b. Faces flush
3. Temporarily Secure Plate	1. By toenailing to sole plate a. With 8d nails b. Approximately 4' apart 2. By face nailing to subfloor or sole plate a. With duplex-head nails b. As required to hold in place

TASK SHEET

IV-A-2a(TS)

TASK: Mark Door Openings
 JOB: Lay Out And Mark Sole And Top Plates
 TRADE: Building Trades
 TOOLS AND MATERIALS: Framing square, pencil, blueprints
 TASK BREAKDOWN:

STEPS	KEY POINTS
CHECK POINT:	<u>Note:</u> Double check door centerline location and door rough opening size in sole plate to agree with plans and specifications
1. Position Framing Square	1. On one side of door opening 2. Inside of body flush with inside of sole plate 3. Tongue across both plates 4. Outside of tongue flush with end of sole plate
2. Mark Lines	1. On top plate 2. Along outside edge of tongue 3. On both plates 4. Along inside edge of tongue
3. Reposition Framing Square	1. So that outside of tongue is on last line marked 2. Body still flush with inside of plate
4. Mark Line	1. On both plates 2. Along inside edge of tongue
5. Identify Type Stud	1. Mark "T" for trimmer stud a. In space closest to door opening b. Both plates 2. Mark "X" for regular stud a. In 2nd space b. Both plates <u>Note:</u> Repeat steps #1 thru #5; opposite side of door

TASK SHEET

IV-A-2b(TS)

TASK: Mark Window Openings
JOB: Lay Out And Mark Sole And Top Plates
TRADE: Building Trades
TOOLS AND MATERIALS: Framing square, pencil, blueprint, 50' steel tape measure
TASK BREAKDOWN:

STEPS	KEY POINTS
1. Locate Window Center	1. Refer to floor plan for dimension 2. Measure from building line according to blueprints 3. Along inside of sole plate 4. With steel measuring tape 5. Mark center on face of sole with a line square to inside edge of sole
2. Lay Out Window Rough Opening	1. Refer to window schedule for size 2. Measure $\frac{1}{2}$ window rough opening 3. Each side of window centerline 4. Mark with arrows
3. Position Square And Mark Studs	1. Position framing square on sole plate 2. Body flush to inside of plate and pointing to window centerline 3. Tongue across plates with inside edge to mark 4. Mark lines on both sides of tongue, square to both plates 5. Mark "T" for trimmer between lines; both plates 6. Slide square out so that inside of tongue is on line just drawn to the outside of tongue 7. Mark line on outside of tongue; square to both plates 8. Mark "X" between 2nd and 3rd line; both plates 9. Repeat keypoints #1 thru #8, step 3 for opposite side of window

TASK SHEET

IV-A-2c(TS)

TASK: Mark Partitions
 JOB: Lay Out And Mark Sole And Top Plates
 TRADE: Building Trades
 TOOLS AND MATERIALS: Framing square, pencil, blueprints
 TASK BREAKDOWN:

STEPS	KEY POINTS
1. Position Framing Square	1. Inside of body flush with inside of sole plate 2. Tongue across both plates 3. Outside of tongue in line with edge of partition plate 4. Tongue to outside of partition plate
2. Mark Plates	1. With a line on each side of tongue 2. Square across both plates 3. Mark "X" between lines; both plates
3. Reposition Framing Square	1. Place square to opposite side of partition plate 2. Outside of tongue in line with opposite side of partition plate 3. Tongue to outside of partition plate
4. Mark Plates	1. With a line on each side of tongue 2. Square across both plates 3. Mark "X" between lines; both plates
5. Position Framing Square	1. On partition plate 2. Inside of body flush with edge of plate 3. Tongue across plate 4. Outside of tongue flush with plate joint (end)
6. Mark Partition	1. With a line along inside of tongue 2. Square across partition plates 3. Mark "X" between line and end of partition 4. Letter "Tee" on plate between "X"s Note: Repeat steps #1 thru #6; all partition tees

TASK SHEET

IV-A-2d(TS)

TASK: Mark Corner Posts
 JOB: Lay Out And Mark Sole And Top Plates
 TRADE: Building Trades
 TOOLS AND MATERIALS: Framing square, pencil, 6' ruler, or tape
 TASK BREAKDOWN:

STEPS	KEY POINTS
1. Lay Out And Mark Outside Corner Posts	1. Measure $4\frac{1}{2}$" from outside building line 2. Along sole plate with end flush to said building line 3. Mark both plates with line square to inside of sole plate 4. Divide $4\frac{1}{2}$" length into (3) equal spaces of $1\frac{1}{2}$" 5. Mark both plates with lines square to inside of sole plate Note: This is easily done by placing body of framing square flush to inside edge of sole plate with tongue across plates. As tongue is $1\frac{1}{2}$" wide, the inside edge may be placed on the line and the next line drawn to the outside edge 6. Mark "X" in 1st and 3rd spaces 7. Measure 5" from adjacent outside building line 8. Along adjacent sole plate 9. Mark both plates with a line square to inside of sole plate 10. Mark "X" between line and end of adjacent plates
2. Lay Out And Mark Inside Corner Posts	1. Measure $4\frac{1}{2}$" from inside corner or sole plate 2. Along sole plate with end flush to inside corner 3. Mark both plates with a line square to inside of sole plate 4. Divide $4\frac{1}{2}$" length into (3) equal spaces of $1\frac{1}{2}$" 5. Mark both plates with lines square to inside of sole plate 6. Mark "X" in 1st and 3rd spaces

STEPS

KEY POINTS

7. Measure 5" from inside corner of sole plate
8. Along adjacent inside sole plate line
9. Mark both plates with a line square to inside of sole plate
10. Mark "X" between line and end of adjacent plate

TASK SHEET

IV-A-2e(TS)

TASK: Mark Regular Studs, Cripple Studs
 JOB: Lay Out And Mark Sole And Top Plates
 TRADE: Building Trades
 TOOLS AND MATERIALS: Blueprints, 6' ruler, framing square, pencil
 TASK BREAKDOWN:

STEPS	KEY POINTS
	Note: Lay out and mark one wall at a time. Start at the building front left corner
1. Locate 1st Stud	1. Measure 15½" from end of plates (building line) 2. Along inside of sole plate 3. Mark with arrow
2. Mark 1st Stud	1. Position framing square face up on sole plate 2. Inside of body flush to inside of plate 3. Tongue across plates with inside edge on mark 4. Mark lines both sides of tongue; square with plates 5. Mark "X" between lines; both plates
3. Locate And Mark All Other Studs	1. Move framing square along plate 2. Align 16" mark on inside of body with 1st line just marked 3. Mark lines on both sides of tongue; square with plates 4. Mark "X" between lines; both plates Note: Continue marking studs on 16" intervals until wall is complete. Studs within window openings mark "C" top plate only. Studs which conflict with other vertical wall members leave out but continue 16" spacing
CHECK POINT:	After marking studs for one wall check lay out with steel tape. From first stud line to corresponding stud lines, intervals 16", 32", 48", 64", 80", 96", etc.

INSTRUCTOR'S PLAN INFORMATIONAL LESSON

IV-B-1(I)

- SUBJECT:** Corner Posts, Types and Construction
- AIM:** The student will be able to explain the purpose of, and procedure for, construction of the two most frequently used corner posts in platform wall framing.
- TEACHING AIDS:** Information Sheet IV-B-1(IS), Chalkboard
Samples: One each type corner post
- MATERIALS:** (3) 2 x 4 studs (precut), (3) 2 x 4 spacer blocks, 10d and 16d common nails, chalk
- REFERENCES:** Wagner, William H., Modern Carpentry, Unit 4
Feirer, John L. and Hutchins, Gilbert R., Guide to Residential Carpentry, Unit 14
- PREREQUISITE EXPERIENCE OF THE LEARNER:** The student must have successfully completed lessons IV-A-1(I) and IV-A-2(I) and continue to show a sincere interest in learning the building trades.

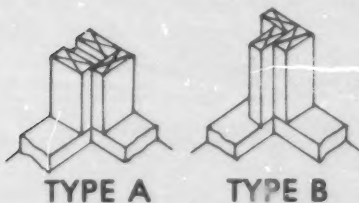
I. PREPARATION (OF THE LEARNER - MOTIVATION)

Corners are formed when the ends of two walls are brought together. In conventional framing, this juncture usually occurs at right angles or 90°-"square with each other"- and may form either inside or outside corners. The corner posts, in wood frame walls, must provide two good nailing bases for inside wall covers, and two good nailing bases for outside wall sheathing; therefore they are built up from three or more regular studs. The built-up corner post also provides greater strength in the corners to serve both walls.

Corner posts may be made several different ways. The two more popular methods discussed in this lesson can be applied to both inside and outside corners.

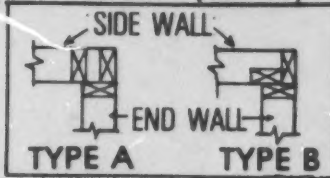
II. PRESENTATION (OF THE INFORMATION)

INSTRUCTIONAL TOPICS TEACHING POINTS	THINGS FOR STUDENTS TO DO THINGS FOR INSTRUCTOR TO DO OR SAY
A. Purpose of Corner Post	1. Provide greater strength 2. Provide two good nailing bases a. For inside wall covering b. For outside wall sheathing 3. Often used as brace post to tie and plumb other wall frame components
B. Types of Corner Posts Pass out: IV-B-1(IS)	1. Show illustrations of different type posts 2. Explain arrangement of stud components in corner posts a. To provide inside corner for nailing interior wall covering b. To provide outside corner for nailing wall sheathing c. Provide additional strength in corners



II. PRESENTATION (CON'T.)

IV-B-1(I)



C. Methods of Erection And Assembly Refer: IV-B-1(1S)

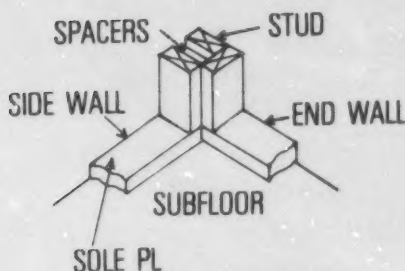
3. Discuss placement (orientation of studs) of corner posts on sole plates
 - a. For nailing purposes
 - b. For assembly purposes

Note: Illustrate on the chalkboard
1. Corners brought together as parts of wall sections
 - a. Wall sections assembled on subfloor one-at-a-time, and raised
 - b. Extra stud in side wall spaced from end stud with 1 1/4" spacer block, or...
 - c. Extra stud in side wall turned 90° to end stud and flush with inside of wall
 - d. Single stud at end of end wall
 - e. Wall sections brought together, plumbed, and nailed into assembled corner
2. Corner post pre-assembly
 - a. Corner posts constructed as a unit
 - b. Corner posts set, carefully plumbed and braced
 - c. Wall raised in parts or piece at a time

D. Corner Post Material

1. Generally 2 x 4 studs (precut)
2. Same specs as other wall frame material (refer to house plans and specifications)
3. Requirements
 - a. Straight
 - b. Stiff
 - c. Good nail-holding power
 - d. No major flaws/defects
 - e. Easy to work

E. Corner Post Construction Type I

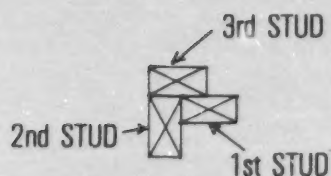
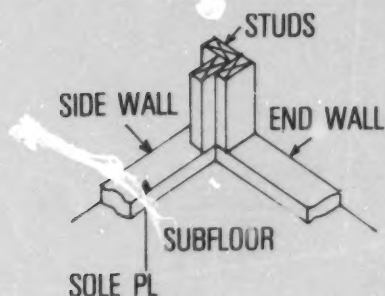


1. Select material to be straight, stiff, have good nail holding power
2. Place 1st stud flat on a good nailing surface
3. Start (2) 10d nails catty-corner in each spacer block
4. Position spacer blocks on 1st stud
 - a. One at each end
 - b. One in the middle
 - c. Sides, ends flush with stud
5. Face nail blocks to stud while holding in place
6. Place 2nd stud on top of blocks; 1st stud
7. Start 16d nails in 2nd stud
 - a. (2) over each block
 - b. Catty-corner opposite 10d nails
8. Face nail 2nd stud to blocks while holding in place

Note: At this point, partial corner post is ready to be installed in a side wall assembled on the subfloor.
(Refer to C-1 this lesson)

9. Turn unit on its side-edges of 2 x 4's up
10. Position 3rd stud flat on top of unit turned on edge
 - a. With edge of 2 x 4 flush to one edge of unit
 - b. With ends flush
11. Start 16d nails in 3rd stud
 - a. 3/4" from flush side
 - b. 4" from each end
 - c. Spaced approximately 24" apart
 - d. In area over each spacer block
12. Face nail 3rd stud to unit

F. Corner Post Construction Type II



1. Select material same as step "E"
2. Position 1st stud on edge on good nailing surface
3. Start 16d nails in 2nd stud
 - a. 3/4" from edge on one face
 - b. Spaced 4" from ends, 16" apart approximately
4. Position 2nd stud flush on 1st stud
 - a. Nails centered over 1st stud
 - b. One edge, ends flush with 1st stud
5. Face nails stud #2 to stud #1
Note: At this point, partial corner post is ready to be installed in a side wall assembled on the subfloor
6. Start 16d nails in 3rd stud same as per 2nd stud
 - a. 3/4" from edge of one face
 - b. Spaced approximately 4" from ends; 16" apart

Note: Stagger nail pattern slightly so as not to interfere with previous nailing
7. Position 3rd stud
 - a. Against studs #1 and #2
 - b. With edge flush to face of stud #1
 - c. With nails centered to edge of stud #1
 - d. With ends flush to nailed unit
8. Face nail 3rd stud to 2nd stud while holding in place
9. Face nail 1st stud to 3rd stud
 - a. Turn unit over
 - b. Use 10d nails spaced approximately same
 - c. Face nail inside edge

III. APPLICATION (DRILL, ILLUSTRATIONS, ANALOGIES, ORAL QUESTIONS, OR ASSIGNMENTS, MAKING INVESTIGATIONS OR EXPERIMENTS, NOTE TAKING, MAKING SKETCHES, PARTICIPATING IN DISCUSSION.)

Students list steps in corner post construction type "A"

Students list steps in corner post construction type "B"

Students make sketches of different types of corner posts
(Place notes/sketches in notebook)

Class Discussion:

Materials used in corner post construction

Procedures in corner post construction/erection

Arrangement of studs in corner posts. Reasons for!

Assembly nailing sequence; nailing patterns. Reasons for!

IV. VERIFICATION AND/OR EVALUATION (FINAL CHECK ON STUDENT'S COMPREHENSION OF MATERIALS PRESENTED.)

Essay:

1. List three requirements (purposes) of built-up corner posts.

Answer: 1. Provide greater strength
2. Provide two good nailing bases for inside wall covers
3. Provide two good nailing bases for outside wall sheathing

2. List three requirements for corner post material.

Answer: 1) Stiffness, 2) straightness, 3) good nail-holding power

3. Explain why, in setting built-up, (3) stud spaced corners, the spaced studs should sit on the plate which extends to the building line.

Answer: If wall sections are assembled on the subfloor and raised into position, then plumbed and connected at the corners, it allows the ends of each wall section to be completely box (framed) before raising.

If the corner post is assembled and set in place first, this arrangement provides the best base for toenailing the corner post to the sole plates.

4. Why are 10d nails used in the construction of the (3) stud offset corner post?

Answer: 10d nails are used when nailing the face of one 2 x 4 to the face of another 2 x 4 because a longer nail would protrude and stick out in the nailing base for exterior wall sheathing.

V. SUMMARY (GIVE A BRIEF ACCOUNT OF EACH TOPIC REEMPHASIZING THE IMPORTANT POINTS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENTS.)

The purpose of corner post construction is to provide greater strength in the corners and to provide two good nailing bases for the inside wall covering and the outside wall sheathing.

The two popular types of corner posts used in multi-member--platform wall framing are constructed of (3) standard pre-cut 2 x 4 studs. One type employs spacer blocks in the construction to position the studs properly and may be referred to as a three-stud "spaced" corner post. The other type offsets the studs for the proper position and may be referred to as a three-stud "offset" corner post.

The two methods of assembly/erection are: (1) pre-assembly of wall sections on the subfloor, one-at-a-time; the walls are raised one-at-a-time, brought together, plumbed, and tied forming a corner and (2) the corner post is constructed, set in place, plumbed and braced; the wall members are then raised in parts, or piece at a time, plumbed and tied to the corner posts.

The construction of corner posts should keep the edges and ends of the studs flush so that it will sit on the plates squarely, and the corner posts should be nailed together solidly so that it will act as a single member. Nail patterns should be staggered slightly to prevent splitting the wood or hitting previously driven nails.

SUGGESTED READING FOR STUDENTS:

Modern Carpentry, Unit 8

THE NEXT LESSON IS: IV-B-2(I)

"Partition "T"s, Types and Construction"

INFORMATION SHEET
ON
WALL FRAMING

IV-B-1 (IS)

SUBJECT: Prefabricated Wall Frame Components--Platform Framing

**INTRODUCTORY
INFORMATION:**

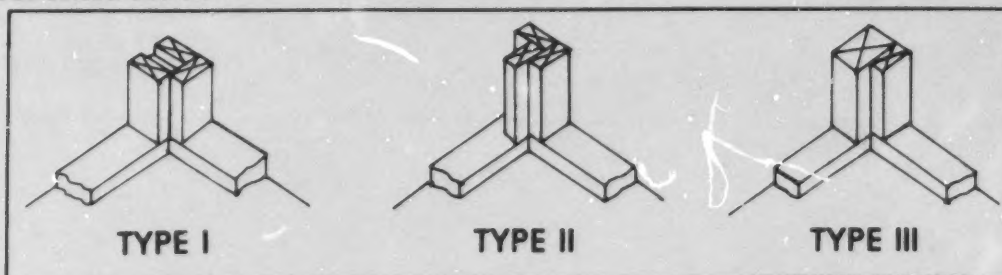
Certain wall frame components are prefabricated, or partially prefabricated, prior to installation in a wall frame assembly. Corner posts, partition "T"s, headers, and sometimes stud-trimmer assemblies are fabricated complete, or in part, and distributed on the subfloor where they will be used in the assembly of the wall frames.

Since, in platform framing, all wall sections are the same height, like components are generally the same. Numbers can easily be determined by counting the number of places on the floor plan where they occur. On many jobs, one carpenter will be assigned the task of fabricating these components while other carpenters start laying out framing members for construction and erection of wall sections. Although there may be a division of labor, all framing carpenters on a job should have a thorough understanding of the job procedures and work together as a team.

GENERAL INFORMATION:

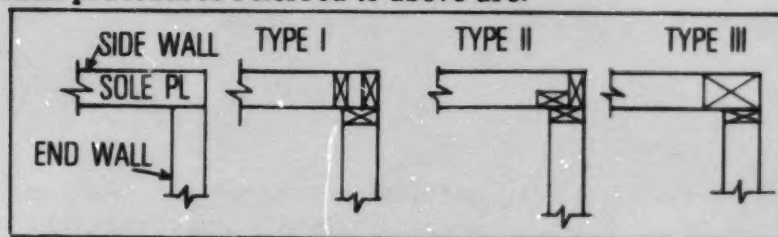
Corner Posts

Corner posts are required when the ends of two walls are brought together. In conventional framing this generally occurs at right angles; 90°, or square with each other. Corner posts must not only provide greater strength for both walls, they must provide two good nailing bases for inside wall coverings and two good nailing bases for outside wall sheathing. Below are three types of corner post construction.



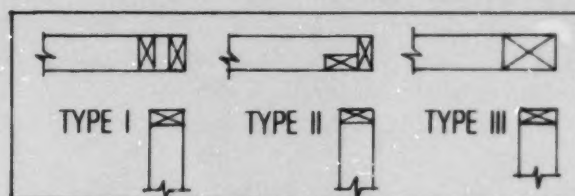
Each type can be prefabricated complete, or "in part", to agree with the construction procedure used in assembly/erection of wall frames.

Construction procedures referred to above are:



WALL SECTIONS ASSEMBLED IN PLACE

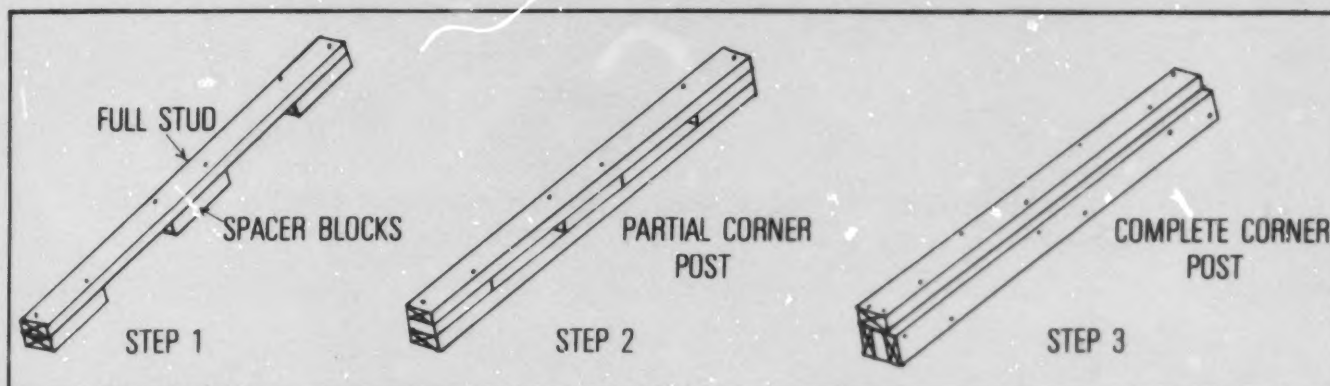
With the sole plates in place, corner posts are fabricated complete; set in place, nailed, plumbed, and temporarily braced. Wall sections are assembled (constructed) in place piece-by-piece.



WALL SECTIONS ASSEMBLED ON SUBFLOOR

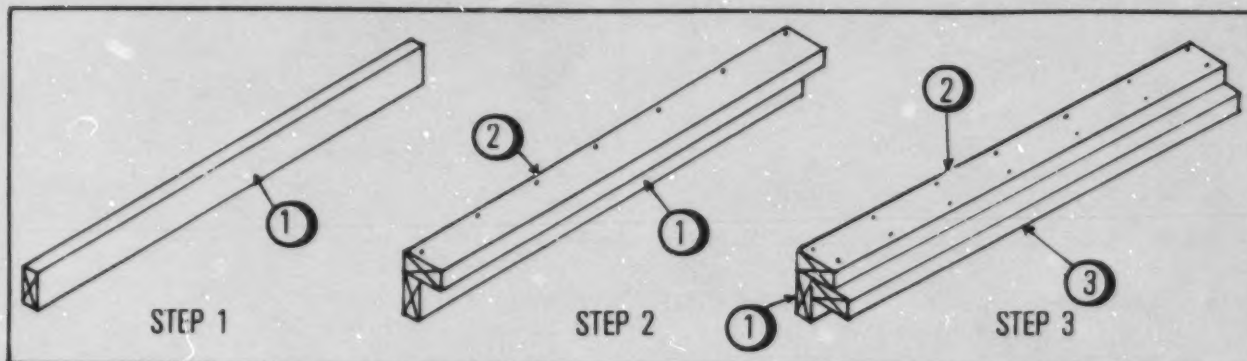
Corner posts are partially fabricated and incorporated in wall sections assembled on the subfloor. Corner posts are completed as the walls are raised, plumbed, and brought together. Of the three types of corner posts illustrated above, type I is the standard type most used in conventional wall framing while types II and III are considered alternate methods.

The type I corner post requires (3) 2 x 4 studs (pre-cut), (3) 2 x 4 spacer blocks 12"-16" long, 10d and 16d common nails, and (3) steps to construct.



1. Space (3) 2 x 4 blocks flat under stud on good nailing surface with ends, sides flush to stud. Nail in place with 16d common nails--turn protruding nails with grain.
2. Position 2nd stud flat on top of 2 x 4 blocks with ends, sides flush to nailed unit. Nail in place with 16d common nails using same nailing pattern as opposite side.
Note: Step #2 completed constitutes a partial corner post as would be incorporated in side walls assembled on the subfloor.
3. Lay nailed unit on its side with ends, one side flush to nailed unit. Nail in place with 10d nails--to full stud, to spacer blocks.

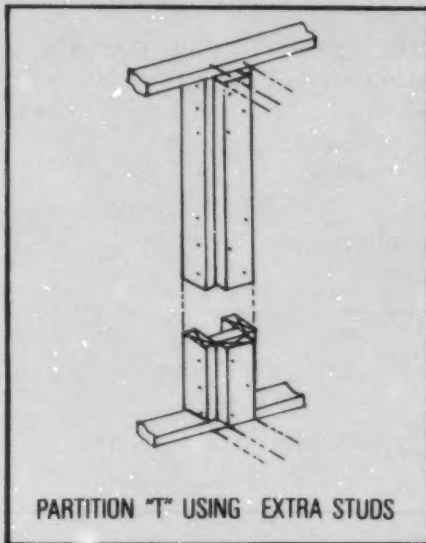
The type II corner post also requires (3) 2 x 4 studs (pre-cut), 10d and 16d common nails, and three steps to construct.



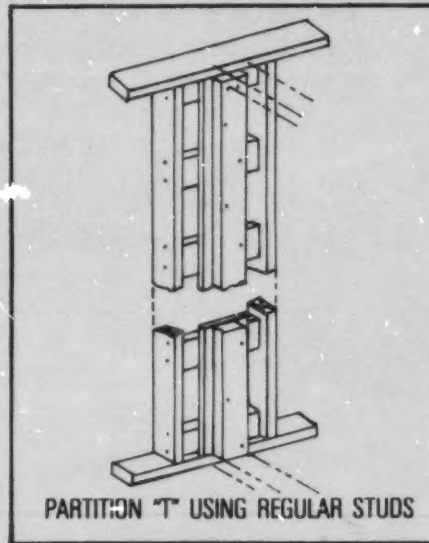
1. Position stud #1 on edge horizontally on a good nailing surface.
2. Position stud #2 flat on top of stud #1 with ends, one side flush. Nail stud #2 to stud #1 with 16d common nails centered over stud #1 and spaced approximately 16" apart.
Note: Step #2 completed constitutes a partial corner post as would be installed in a side wall section assembled on the subfloor.
3. Position stud #3 flat on edge of a good nailing surface. Position the inside corner of the nailed unit (studs 1 & 2) on stud #3:
 - a. With stud #2 flat against the top of stud #3
 - b. With stud #1 on edge against the edge of stud #3
 - c. With sides flush
 Nail stud #2 to stud #3 with 10d nails set 3/4" from edge and spaced approximately 16" apart.
 Nail stud #1 to stud #3 with 16d nails similarly as stud #2 was nailed to stud #1 (see step #2)

Partition "T"s

Partition "T"s are required where one wall abuts another wall other than at a corner. Partition "T"s serve the same purposes as corner posts in their respective position. There are two types of partition "T"s constructed in platform wall framing: (1) partition "T" using extra studs; (2) partition "T" using regular studs.

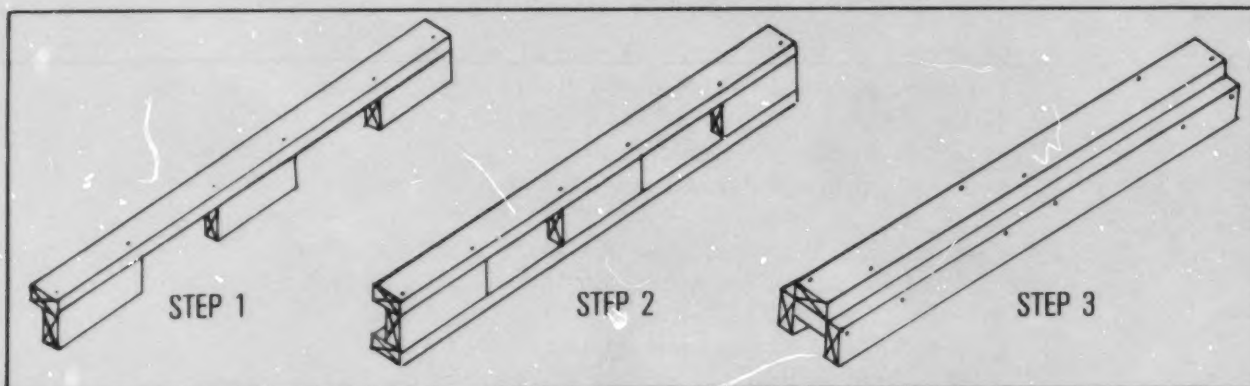


PARTITION "T" USING EXTRA STUDS



PARTITION "T" USING REGULAR STUDS

To fabricate a partition "T" using extra studs requires (3) 2 x 4 studs (pre-cut), (3) 2 x 4 spacer blocks 12"-16" long, 10d and 16d common nails, and three steps to construct.



1. On a good nailing surface, space (3) 2 x 4 blocks, on edge, under a pre-cut 2 x 4 stud; flush at ends, one edge. Nail stud to blocks with 16d common nails while holding in place.

2. Turn nailed unit over and position 2nd stud on top of blocks opposite of 1st stud. Nail 2nd stud to blocks with 16d common nails as 1st stud. Stagger nail pattern slightly to prevent hitting nails on opposite side.

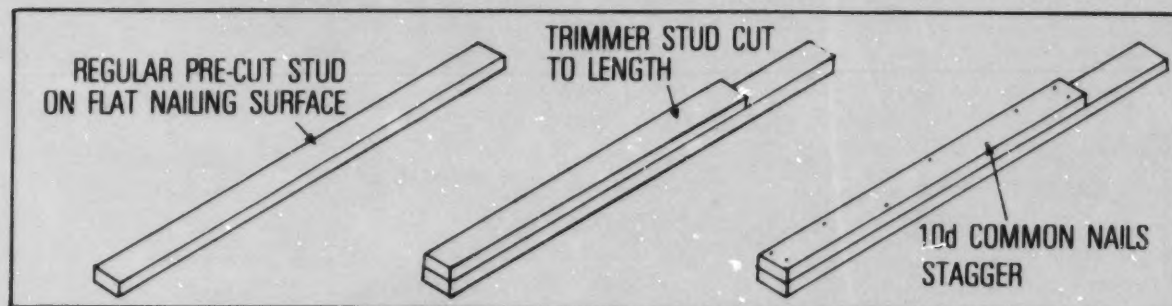
Note: Step 2 completed constitutes a partial partition "T" as would be incorporated in wall to be abutted as it is assembled on the subfloor.

3. Lay nailed unit flat; studs 1 and 2 on edge; spacer blocks up. Position stud #3 flat on top of spacer blocks with ends, sides flush. Nail stud to spacer blocks with 10d common nails while holding in place.

Trimmer/Stud Assembly

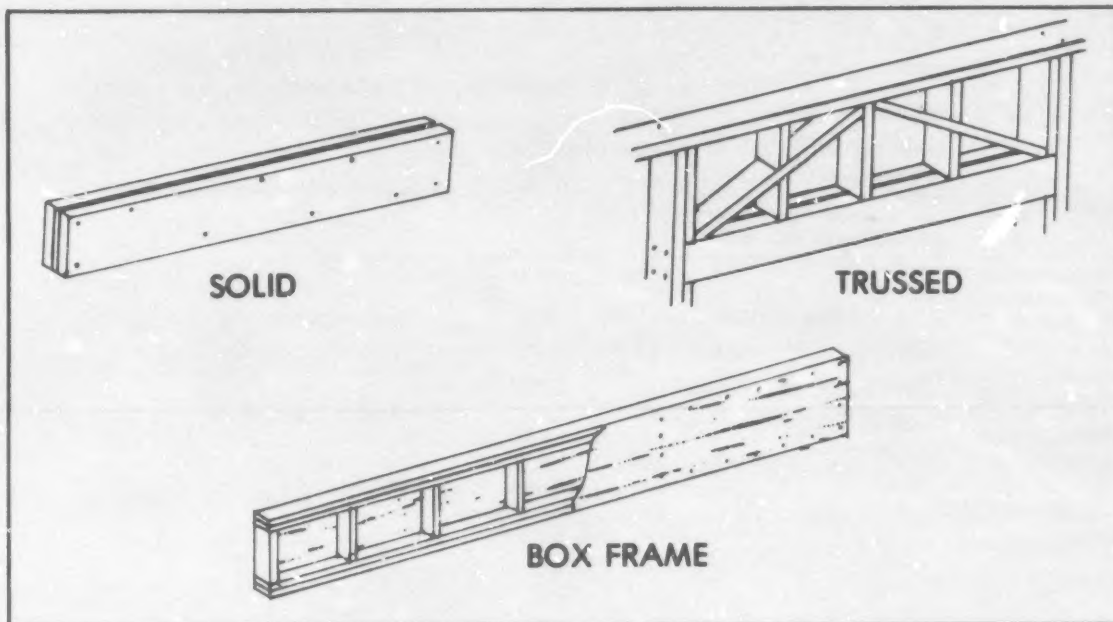
The trimmer/stud assembly, each side of major wall openings is probably the easiest wall frame component to prefabricate. Simply:

1. Determine the height of the R.O. off the subfloor; subtract sole thickness ($1\frac{1}{2}$ "); and cut trimmer stud to length, square.
2. Position flat on regular pre-cut stud on good nailing surface; one end, sides flush.
3. Face nail to regular stud with 10d common nails, staggered and spaced approximately 1'-0. Distribute to area on sub-floor for assembly in wall section.



Headers

Headers, generally, are horizontal framing members which enclose the tops of wall openings and support building loads above these openings. Headers also serve as a nailing base for wall coverings and trim.



There are several different styles/types of headers--solid, trussed, box frame. The type header employed in a wall depends on where it is located; the distance it must span; and the loads it must support. The most frequently used header in general home construction is the solid header. It is quick and simple to construct and is satisfactory for most house framing applications. The solid header is constructed of (2) 2" framing members turned on edge, with a $\frac{1}{2}$ " plywood spacer to make it the same width as the wall frame, and nailed together with 16d common nails spaced approximately 1'-0 apart and staggered from side to side (see above). The length (span) of this type header can be increased by increasing the width of the 2" framing members (see chart below).

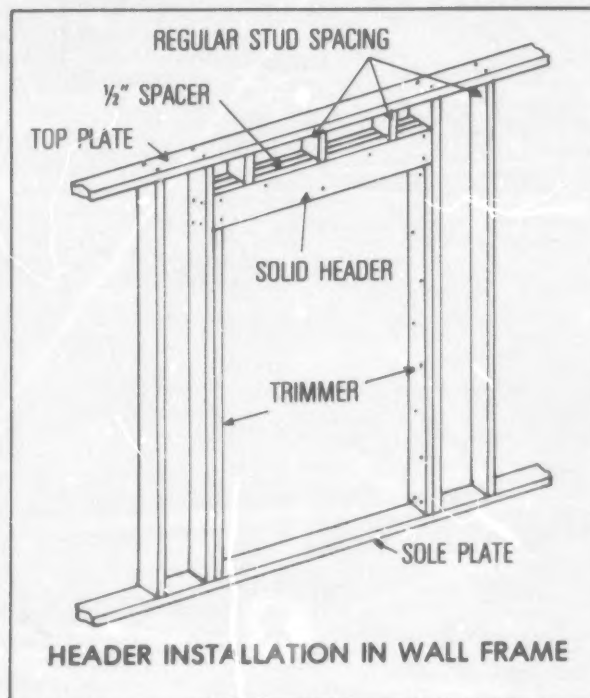
	SOLID HEADER SPANS	
FRAMING MEMBERS ON EDGE	SUPPORTING ONE FLOOR, CEILING, ROOF	SUPPORTING ONLY CEILING, ROOF
2 x 4	3'-0	3'-6
2 x 6	5'-0	6'-0
2 x 8	7'-0	8'-0
2 x 10	8'-0	10'-0
2 x 12	9'-0	12'-0

Some builders size the header for the greatest span and make all the headers of the same size material. To construct a solid header:

1. Determine header size. Use R.O. opening +3" and chart "Header Spans" to conclude "size and length" of 2" framing members.
2. Cut 2" framing members, $\frac{1}{4}$ " plywood spacer to size, square.
3. Stack spacer between 2" framing members on good nailing surface.
4. With ends, edges flush, nail into solid header using 16d nails.

Trussed headers and box frame headers are incorporated in wall frames when the building loads are especially heavy or the spans are unusually wide. In either case, this type headers are specially designed and drawings will appear in the plans and details for their construction/fabrication and installation.

After construction, solid headers should be marked for identification and distributed to their locations on the subfloor in readiness for assembly of wall sections.



To install solid headers, position the header between the full studs each side of the R.O. to rest on the trimmer studs so that the header ends butt against the studs and the header by spiking the end of the 2" framing members through the studs with 16d common nails; two nails each end, each 2" framing member of header.

Both trimmer/stud assemblies and solid headers bend themselves equally well to either wall framing procedure when prefabricated prior to wall assembly.

INSTRUCTOR'S PLAN
INFORMATIONAL LESSON

IV-B-2(I)

SUBJECT: Partition "T"s, Types and Construction

AIM: The student will be able to explain the purpose and function of a partition "T" and describe the proper procedure for constructing same

TEACHING AIDS: Information sheet IV-B-1(1S), Chalkboard
Sample: Pre-assembled partition "T"

MATERIALS: (3) 2 x 4 studs (pre-cut), (3) 2 x 4 spacer blocks 16" lg., 16d common nails

REFERENCES: Wagner, William H., Modern Carpentry, Unit 4
Feirer, John L. and Hutchins, Gilbert R., Guide To Residential Carpentry, Unit 14

PREREQUISITE EXPERIENCE OF THE LEARNER: The student must have successfully completed lessons IV-A-1(I) and IV-A-2(I) and continue to show a sincere interest in learning the building trades.

I. PREPARATION (OF THE LEARNER - MOTIVATION)

Partition "T"s are required when one wall abuts another wall other than at a corner. Again, in conventional wall framing this juncture generally occurs at rights angles, or 90°.

The partition "T" serves the same purpose in this type wall connection as the corner post does at a corner connection. There are two popular methods of constructing partition "T"s. Both are discussed in the following lesson.

II. PRESENTATION (OF THE INFORMATION)

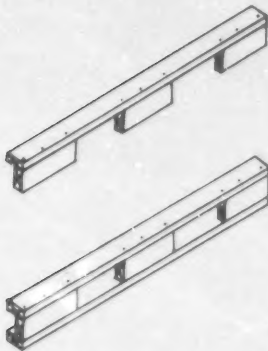
INSTRUCTIONAL TOPICS TEACHING POINTS	THINGS FOR STUDENTS TO DO THINGS FOR INSTRUCTOR TO DO OR SAY
A. Purpose of Partition "T"	1. Provide a means of connecting the two wall frames 2. Provide nailing bases for inside wall covering 3. Provide greater strength to serve both walls
B. Types of Partition "T"	1. Two major types a. Partition "T" using extra studs b. Partition "T" using regular studs; spacing 2. Show illustrations of different types of partition "T" 3. Point out arrangement of framing members to: a. Provide nailing bases for interior walls b. Provide nailing bases for tying wall frames together 4. Discuss methods of construction/erection

C. Construction/ Installation

1. Select Material

1. Quality
 - a. Straight, stiff
 - b. Good nail-holding quality
 - c. No major flaws (splits, checks, knots)
2. Quantity (each partition "T")
 - a. (3) 2 x 4's (pre-cut)
 - b. (3) spacer blocks 12"-16" lg.
 - c. 10d common nails as required

2. Construct Partition: "T" or Partial "T"



1. Position blocks
 - a. On edge
 - b. On good nailing surface
 - c. In line (lengthways)
 - d. Equally spaced 16"-18" apart
2. Position 1st stud
 - a. Flat
 - b. On top of blocks
 - c. In line with, and flush with, edge of blocks

Note: Adjust blocks to be flush at ends, along one edge of stud; spaced equally
3. Start 10d nails in stud
 - a. Three over each block
 - b. Centered with edge of block
4. Spike stud to blocks while holding in place
5. Turn unit over and position 2nd stud on blocks opposite 1st stud
6. Secure 2nd stud as 1st stud (keypoints 2, 3, 4 above)

3. Install Partial "T"



1. Position spaced double stud unit (partial "T")
 - a. In wall frame assembly
 - b. To scribed marks on plates
 - c. Spacer blocks to the side to which abutting wall will connect
 - d. Edge of studs flush with edge of plates.
2. Secure partial "T" to plates
 - a. Use 16d nails
 - b. Spike ends of studs three plates
 - c. Use 10d nails to toenail ends to plates similarly as regular studs

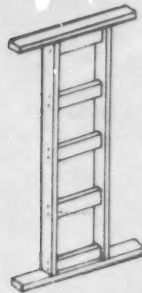
4. Complete Partition "T"

1. As partition wall is raised
2. Position, plumb, and align partition wall
3. With partial "T"
4. Face nail end stud of partition wall
 - a. To partial "T"

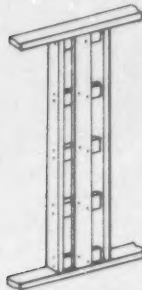


C. Construct Partition "T"

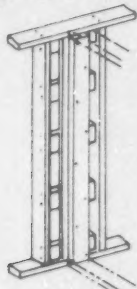
1. Install 2 x 4 Blocks



2. Install Nailer Base



3. Complete Partition "T"



Note: This type partition "T" may also be completely preassembled, set in place and braced similarly to one type corner post construction/erection

Using Regular Studs; Spacing

1. At marks on plates locating partition "T"
2. Position (5) 2 x 4 x 14 1/2 lg. spacer blocks
 - a. Between regular stud spacing
 - b. On edge horizontally
 - c. 3/4" in from edge of wall frame to which partition wall will abut
 - d. Spaced approximately 2'-0 apart vertically

3. Secure spacer blocks
 - a. With 16d common nails
 - b. While holding blocks in place
 - c. Spike thru studs into ends of blocks
 - d. Two nails each end, each block

1. To 2 x 4 spacer blocks
2. Position 1 x 6 x 92 1/2" lg. nailer base
 - a. Vertically against blocks
 - b. On side to which partition wall abuts
 - c. Centered with/straddling location marks of partition wall on plates
3. Secure nailing base
 - a. With 6d common nails
 - b. Face nail to 2 x 4 spacer blocks
 - c. Two nails each block
 - d. Stagger nailing pattern

1. As partition wall is raised and plumbed
2. Align and center vertically with nailing base
3. Face nail end stud of partition wall
 - a. Use 10d common nails
 - b. Stagger nails side to side approximately 16" apart

Note: This type partition "T" may be built into the wall frame during pre-assembly or after wall is erected

III. APPLICATION (DRILL, ILLUSTRATIONS, ANALOGIES, ORAL QUESTIONS, OR ASSIGNMENTS, MAKING INVESTIGATIONS OR EXPERIMENTS, NOTE TAKING, MAKING SKETCHES, PARTICIPATING IN DISCUSSION.)

Class Discussion: (Topics)

- Purposes of partition "T"s in wall framing
- Qualities sought in framing lumber! Why?
- Types of partition "T" construction

III. APPLICATION (CON'T.)

IV-B-2(I)

Construction procedures

Nails and nailing patterns

IV. VERIFICATION AND/OR EVALUATION (FINAL CHECK ON STUDENT'S COMPREHENSION OF MATERIALS PRESENTED.)

Multiple Choice:

1. In partition "T" construction using regular studs, the spacer blocks are generally made of: b
 - a. 2 x 4's, 12"-16" lg.
 - b. 2 x 4's, 14½" lg.
 - c. 2 x 4's, 16" lg.
 - d. 2 x 6's, 12"-16" lg.
2. Studs of a partition "T" are secured to the top plate of the wall frame with: d
 - a. 6d nails
 - b. 10d nails
 - c. 12d nails
 - d. 16d nails
3. The nailer base of a partition "T" using regular studs is generally a: b
 - a. 1 x 4
 - b. 1 x 6
 - c. 1 x 8
 - d. 2 x 6
4. A complete partition "T" using extra studs require: d
 - a. two extra studs
 - b. three extra studs
 - c. two extra studs and two spacer blocks
 - d. three extra studs and three spacer blocks
5. The nailer base of a partition "T" using regular studs should be cut square: b
 - a. 90" lg.
 - b. 92½" lg.
 - c. 94½" lg.
 - d. 96" lg.
6. Spacer blocks for a partition "T" using regular studs are: d
 - a. set flat between studs
 - b. set on edge centered to width of wall frame
 - c. set on edge flush to inside edge of wall frame
 - d. set on edge ¾" from side of the frame to be abutted
7. For toenailing studs to plates, use: c
 - a. 6d nails
 - b. 8d nails
 - c. 10d nails
 - d. 12d nails

V. SUMMARY (GIVE A BRIEF ACCOUNT OF EACH TOPIC REEMPHASIZING THE IMPORTANT POINTS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENT.)

Partition "T"s serve the same purpose where one wall abuts another as corner posts do where two walls join to form a corner; that is, they provide a means of connecting the two wall frames, provide nailing bases for inside and/or outside wall coverings, and provide greater strength to serve both walls.

There are two types of partition "T"s constructed by homebuilders using platform wall framing. One employs the use of extra studs assembled and placed in the wall frame at the point where the partition wall connects. The other

uses regular studs and spacing and incorporates spacer blocks and a backing board for a nailing base at the point where the partition wall connects.

Either type partition "T" may be constructed in part as their respective wall frames are pre-assembled on the subfloor and tied together in a single unit as the walls are raised, plumbed, and brought together, or...

Either type may be constructed complete, set in place, plumbed, and secured as the wall frames are constructed/erected piece-at-a-time. The method of constructing partition "T"s depends a great deal on the wall framing procedures. The type construction is dictated by the plans and details.

Whatever method of construction, or type of partition "T", it is important to remember its purpose and function, and to construct this member properly so that it will perform its function properly. Attention should be paid to such details as the selection of material; the placement of material; sizes and nailing patterns--too large and too many nails will split the wood, too small and too few nails will not hold the wood.

SUGGESTED READING FOR STUDENTS:

Modern Carpentry, Unit 8
Fundamentals of Carpentry, Chapter 4

THE NEXT LESSON IS: IV-B-3(I) "Headers, Types and Construction"

INSTRUCTOR'S PLAN
INFORMATIONAL LESSON

IV-B-3(I)

SUBJECT: Headers, Types and Construction

AIM: The student will be able to identify and explain the purpose of different types of headers used in platform house framing.

TEACHING AIDS: Information Sheet IV-B-1(IS), Chalkboard, Model Wall frame

MATERIALS:

REFERENCES: Wagner, William H., Modern Carpentry, Unit 4
Feirer, John L. and Hutchins, Gilbert R., Guide to Residential Carpentry, Unit 14

PREREQUISITE EXPERIENCE OF THE STUDENT: The student must have successfully completed lessons IV-A-1(I) and IV-A-2(I) and continue to show a sincere interest in learning the building trades.

I. PREPARATION (OF THE LEARNER - MOTIVATION)

Headers are the horizontal structural members above major openings in wall frames. Headers serve to close in the tops of the openings and to support all framing members, and their loads, above these openings.

There are several different types (styles) of header. The type of header employed in a wall depends on where it is located, the distance it must span, and the loads it must support.

The carpenter should be familiar with all types of headers and be prepared to construct and install headers as prescribed in the architect's plans, details, and specifications.

II. PRESENTATION (OF THE INFORMATION)

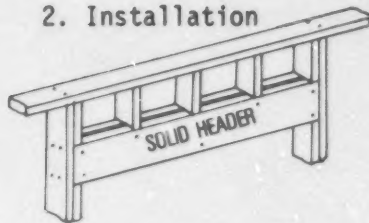
INSTRUCTIONAL TOPICS TEACHING POINTS	THINGS FOR STUDENTS TO DO THINGS FOR INSTRUCTOR TO DO OR SAY
A. Purposes of Header	1. Enclose top of major wall openings 2. Support framing members, building loads above wall openings 3. Nailing base for: a. Interior wall cover b. Exterior sheathing/siding c. Window/door casement d. Window/door trim
B. Types of Header	1. Three major types in wood framing a. Solid b. Built-up truss c. Box frame 2. Show example/illustration of each type 3. Explain purpose of each type--where used! 4. Discuss construction/installation of each type

C. Solid Header

1. Construction



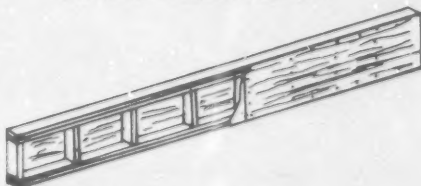
2. Installation



D. Trussed Header



E. Box Frame Header



1. Most used type in home construction
2. Consists of:
 - a. (2) 2" framing member turned on edge
 - b. $\frac{1}{2}$ " spacer (plywood) sandwiched between
 - c. Nailed into solid unit with 16d nails
1. Size header
 - a. According to span
 - b. According to load
 - c. Refer to chart "Header Spans", IV-A-1(IS)
 - d. Discuss with class
2. Select framing material
 - a. Size
 - b. Quality
3. Cut framing material to length, square
4. Cut $\frac{1}{2}$ " spacer (plywood) to size
5. Position pieces on sound nailing surface
 - a. Stacked flat
 - b. With spacer sandwiched in middle
 - c. With sides, ends flush
6. Nail pieces into a solid unit
 - a. While holding in place
 - b. Face nail using 16d nails
 - c. (2) near each end, others staggered approximately 16" in middle
1. Position header
 - a. On edge
 - b. On top of trimmer studs
 - c. Between full studs each side of R.O.
 - d. Flush with sides of wall frame
2. Secure header
 - a. With 16d common nails
 - b. Spike nail pattern slightly
1. Often used where
 - a. Loads are especially heavy
 - b. Spans are unusually wide
2. Truss headers are usually calculated and designed by architect
 - a. Based on careful calculations
 - b. Employ standard framing materials
 - c. Apply strength/stiffness thru triangular braced construction
3. Construct according to architect's plans and details
4. Installed similarly to solid header
1. Used for exceptionally long spans over
 - a. Garage doors
 - b. Wide fireplaces
 - c. Picture windows, glazed walls
2. Box frame headers usually calculated and designed by architect
3. Refer to architect's plans and details for size and construction

4. Usually constructed of:
 - a. 2" framing members (box)
 - b. Covered with plywood both sides

Note: Plywood thickness varies with design. Head thickness--same as wall thickness
5. Installed in R.O. similarly as solid header

III. APPLICATION (DRILL, ILLUSTRATIONS, ANALOGIES, ORAL QUESTIONS, OR ASSIGNMENTS, MAKING INVESTIGATIONS OR EXPERIMENTS, NOTE TAKING, MAKING SKETCHES, PARTICIPATING IN DISCUSSION.)

Field Trip! Apartment/Housing Development in framing stage

Arrange Trip:

- Permission from developer
- Permission from school
- Confirm date, time
- Arrange transportation to and from
- Parental permission

Preview Trip:

- Explain purpose and function of trip
- Tell students what to look for!
- Review personal/group conduct, safety
- Place date, time schedule on chalkboard
- Pass out parental permission slips

Take Trip! Point out:

- Type of framing
- Framing techniques; procedures
- Wall frame components
- Types of corner posts, partition "T"s, headers employed! Where!
- Unique methods, techniques, tools, teamwork

Review Trip! Class Discussion:

- Overall job construction
- Different carpentry jobs involved
- Duties and responsibilities of each
- Working as a team
- Organization and management

IV. VERIFICATION AND/OR EVALUATION (FINAL CHECK ON STUDENT'S COMPREHENSION OF MATERIALS PRESENTED.)

True - False:

1. The main purpose of a header is to enclose the top of a wall opening. F
2. A solid header is same thickness as the wall frame is wide. T
3. Solid headers are composed of (2) 2" framing members turned on edge with a $\frac{1}{2}$ " plywood spacer between. T

IV. VERIFICATION (CON'T.)

IV-B-3(I)

- | | |
|---|----------|
| 4. Solid headers are nailed into a single unit with 10d nails. | <u>F</u> |
| 5. The length of a header should equal the rough opening plus 3". | <u>T</u> |
| 6. Headers are supported by cripple studs. | <u>F</u> |
| 7. Headers are generally secured by end nailing the 2" members of the header thru the full studs at each end. | <u>T</u> |
| 8. Trussed headers are usually calculated and designed by the architect. | <u>T</u> |
| 9. Box frame headers are employed where spans are exceptionally long. | <u>T</u> |
| 10. Headers are not necessary in interior wall framing. | <u>F</u> |

V. SUMMARY (GIVE A BRIEF ACCOUNT OF EACH TOPIC REEMPHASIZING THE IMPORTANT POINTS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENT.)

The purpose of a header is to support the framing members and their building loads above wall openings. The header also encloses the top of the rough opening and serves as a nailing base for wall coverings, casements, and trim.

There are several types of headers employed in wood frame construction--solid, trussed, box frame. The most popular type used in home construction is the solid header. It is composed of two 2" framing members turned on edge, with a $\frac{1}{2}$ " plywood spacer between to attain proper thickness, and face nailed into a solid unit. The span can be increased by increasing the width (size) of the framing members. Two 2 x 12's can span up to 9'-0" and support normal loads of one floor, ceiling, and roof or...up to 12'-0" supporting normal ceiling and roof loads. This is sufficient for most home construction. Solid headers fit between the full studs each side of the rough opening and rest on top of the trimmer studs. They are secured by end nailing the 2" framing members of the header thru the studs.

Trussed and/or box frame headers are employed when there are excessive loads to bear or exceptional lengths to span. These types of headers are specially designed by the architect, and the plan and detail drawings should be followed in their construction.

SUGGESTED READING FOR STUDENTS:

Modern Carpentry, Unit 8

Framing, Sheathing, and Insulation, Unit 11

THE NEXT LESSON IS: IV-C-1(I)

"Wall Bracing"

INSTRUCTOR'S PLAN MANIPULATIVE LESSON

IV-B-1(S)

TASK:	Construct Corner Post
AIM:	The student will be able to construct corner post for a stud wall using various methods of construction to comply with good building practices.
TOOLS AND EQUIPMENT:	6' folding rule, try square, pencil, claw hammer (14-16 oz.), nail apron, safety glasses
MATERIALS:	2 x 4 studs (precut), 2 x 4 shorts (12"-16" lg.), 10d and 16d common nails
PREREQUISITE EXPERIENCE OF THE LEARNER:	The student must be familiar with safety involved in stooping, lifting, and nailing. Must be strong enough to lift corner post.
CHECKING STANDARDS:	1. Accuracy in selection of materials 2. Accuracy in placement of materials 3. Accuracy in nailing

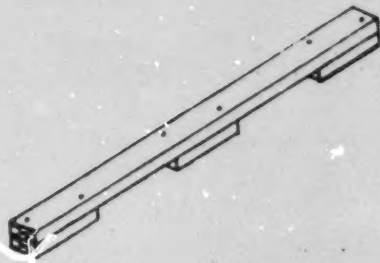
I. PREPARATION (OF THE LEARNER - MOTIVATION)

Corner posts are an integral and important part of the wall frame. It serves as the vertical support member at the junction of two walls and may form an inside or an outside corner.

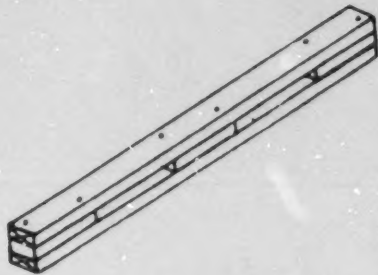
There are two types of corner post construction in popular use today. Each type should be well constructed as corners are often the first wall member erected and are used to tie to and plumb the other wall frame components.

II. PRESENTATION (OF THE SKILLS)

KEY POINTS	KEY POINTS (THINGS TO REMEMBER TO DO OR SAY)
Type A	Note: This post is most popular in use today and is used exclusively for outside walls in platform construction
1. Select Material	1. Regular precut 2 x 4 studs (3) a. Stud quality b. Straight 2. 2 x 4 shorts 12"-16" long (3) a. Sound b. Ends square c. Good nail holding quality 3. 12d or 16d nails
2. Nail 1st Stud To Blocks	1. Position 1st stud on blocks a. Flat - one face up b. On a sturdy base for nailing

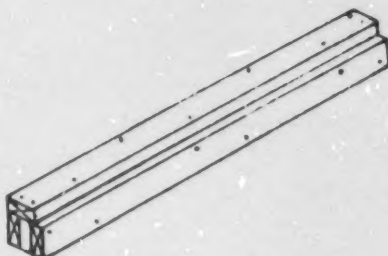


3. Nail 2nd Stud To Blocks



4. Complete Nailing 1st Stud

5. Nail 3rd Stud To Assembly



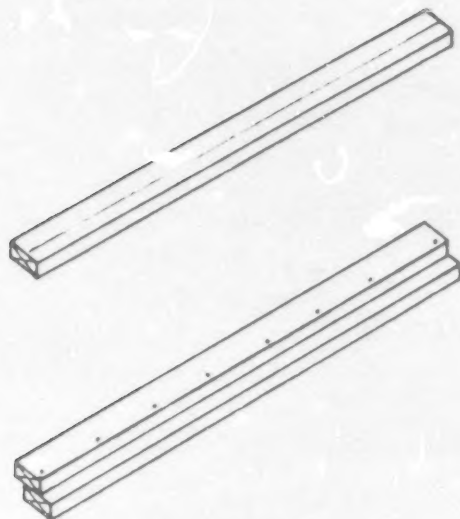
2. Space blocks under stud
 - a. (1) block at each end of stud
 - b. (1) block in middle of stud
 - c. Blocks flush with sides; ends of stud
3. Start 10d nails in stud
 - a. (2) nails over each block
 - b. Catty-corner
 - c. 2" from ends, 3/4" from sides
 - d. Straight and vertical
4. Secure blocks to stud
 - a. Hold each block in position
 - b. Spike blocks to stud one-at-a-time
1. Position 2nd stud
 - a. On top of blocks; 1st stud
 - b. Flat - one face up
 - c. Sides, ends of stud flush with blocks; 1st stud
2. Start 16d nails in 2nd stud
 - a. (2) nails over each block
 - b. Catty-corner
 - c. 2" from ends, 3/4" from sides
 - d. Straight and vertical
3. Recheck alignment of stud #2
4. Spike stud to blocks while holding in place
1. Turn assembled studs and blocks over
2. Spike (2) more 16d nails thru 1st stud into each block
 - a. So that nails are staggered similarly as in step #3 - 2 above
 - b. Must be staggered with 10d nails; step #1
1. Place nailed assembly on its side
 - a. Edges of studs face up
 - b. One face toward fabricator
2. Position 3rd stud
 - a. Flat (face up) on assembly
 - b. One edge of stud flush with near side of assembly
 - c. Ends flush with ends of assembly
3. Start 16d nails in 3rd stud
 - a. Centered over edge of 2 x 4 on flush side - side near you
 - b. 4" in from each end; 16" apart
4. Recheck alignment of stud #3
5. Spike stud to assembly while holding in place
6. Spike stud to blocks; (2) 16d nails each block

Type B

1. Select Material

Note: This corner is sometimes used for quick construction for interior wall corners

2. Nail 2nd Stud To 1st Stud



1. Regular precut studs (3)
 - a. Stud quality
 - b. Straight; sound
 - c. Ends square
 - d. Good nail holding quality
2. 12d nails

1. Scribe line on 1st stud
 - a. On face of stud
 - b. $1\frac{1}{2}$ " from edge
- Note: Chalkline may be used
2. Start 12d nails in 2nd stud
 - a. Approximately 1" from edge, on one face
 - b. Approximately 4" from end; 16" apart
 - c. Straight and vertical
3. Position 1st stud
 - a. Flat - one face up
 - b. On a sturdy base for nailing
4. Position 2nd stud
 - a. Flat on stud #1
 - b. Nailed edge to marked line
 - c. $1\frac{1}{2}$ " dimension of stud #1 exposed
 - d. Ends of studs flush
5. Spike 2nd stud to 1st stud while holding in position
 - a. Each end
 - b. Middle

3. Nail 3rd Stud To Assembly



1. Start 12d nails in 3rd stud
 - a. On face; $3/4$ " from one edge
 - b. 4" from end; 16" apart
 - c. Straight and vertical
2. Position 3rd stud
 - a. In $1\frac{1}{2}$ " offset of studs #1 and #2
 - b. On edge, with nails to lower edge
 - c. Ends flush with ends of studs #1 and #2
3. Spike 3rd stud to 2nd stud while holding in place
4. Turn assembly over so that stud #3 stands on its edge, on bottom
5. Spike 1st stud (on top) to 3rd stud
 - a. Use 12d nails
 - b. Spaced approximately 16" apart
 - c. $3/4$ " from edge of 1st stud; centered over 3rd stud
 - d. Straight and vertical

III. APPLICATION (PRACTICED BY LEARNER UNDER CLOSE SUPERVISION)

1. Students practice task under close supervision by instructor.
 2. Students select materials and judge for quality.
 3. Students use light load and demonstrate how to safely handle materials used.
-

Students practice task.

- V. SUMMARY (TELL THE STEPS ON PROCEDURE AS TO WHAT, HOW, AND WHY. REVIEW CHECKING STANDARDS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENTS.)
-

The corner post is an integral part of a frame wall. If not properly constructed it may be too long or cause a crooked corner. Be careful in all measurements, cutting, and assembly.

SUGGESTED READING FOR THE STUDENTS:

Textbook, Modern Carpentry, Unit 8, pp. 135-155

THE NEXT LESSON IS: IV-B-2(S)

"Construct Partition "T"

JOB SHEET
IN
FRAMING

IV-B-1(J)

JOB: Construct Corner Posts

MATERIALS: 2 x 4 precut studs, 2 x 4 shorts (12"-16" lg.), 10d and
16d common nails

TOOLS AND
EQUIPMENT: 6' folding rule, try square, pencil, claw hammer (14-16 oz.),
chalkline, nail apron

GENERAL
INSTRUCTIONS:

PROCEDURES	IV-B-1(TS)	Construct Corner Post (Type A)
AND/OR	IV-B-1a(TS)	Construct Corner Post (Type B)

TASKS:

CHECK POINT: Before proceeding further, have instructor check your work.

TASK SHEET

IV-B-1(TS)

TASK: Construct Corner Post (Type A)

JOB: Construct Corner Posts

TRADE: Building Trades

TOOLS AND 6' folding rule, pencil, claw hammer (14-16 oz.), try square,

MATERIALS: 2 x 4 precut studs, 2 x 4 shorts (12"-16" lg.), 10d and 16d nails

TASK BREAKDOWN:

STEPS	KEY POINTS
1. Select Material	(3) 2 x 4 precut studs; straight; top quality (3) 2 x 4 shorts (12"-16" lg.); ends square; good nail holding quality 10d and 16d nails
2. Position 1st Stud	- Flat - one face up - On a sturdy base - For nailing
3. Start Nails In Blocks	(2) 10d nail in face of each block - Approximately 4" from end - Catty-corner 1" from side - Straight and vertical
4. Position Blocks On 1st Stud	- At each end of stud - In middle of stud - Sides of blocks flush with sides of stud - End of blocks flush with ends of stud
5. Secure Blocks To 1st Stud	- While holding each block in place - Spike 12d nails to stud
6. Position 2nd Stud	- On top of blocks; 1st stud - Flat - one face up - Sides, ends of stud flush with blocks, 1st stud
7. Start Nails In 2nd Stud	(4) 16d nails over area of each block - Start approximately 4" from ends of blocks - Stagger nails from side to side; 1" from sides - Straight and vertical
8. Secure 2nd Stud	- Recheck alignment - Hold in place - Spike 16d nails to blocks
9. Complete Nailing 1st Stud	- Turn nailed assembly over 1st stud on top - Spike (2) more 16 d nails - Thru 1st stud into each block

STEPS	KEY POINTS
	5. Stagger with 12d nails (opposite side) 6. Similarly as in step #7
10. Reposition Nailed Assembly	1. Place nailed assembly on its side 2. Edges of studs up
11. Position 3rd Stud	1. On nailed assembly 2. Flat - one face up 3. One edge flush with one edge of assembly 4. Ends flush with ends of assembly
12. Start Nails In 3rd Stud	1. Use 16d nails 2. Space approximately 4" from end - 16" apart 3. Center over 2 x 4 on flush side (3/4" in from edge)
13. Secure 3rd Stud	1. Recheck alignment 2. Hold in place 3. Spike 16d nails to assembly 4. Straight and vertical
14. Complete Nailing Assembly	1. Use 16d nails 2. (2) over each block 3. Spike thru 3rd stud into blocks 4. Straight and vertical

TASK SHEET

IV-B-1a(TS)

TASK: Construct Corner Post (Type B)
 JOB: Construct Corner Posts
 TRADE: Building Trades
 TOOLS AND MATERIALS: 6' folding rule, try square, pencil, claw hammer (14-16 oz.),
 (3) 2 x 4 precut studs, 10d and 16d common nails
 TASK BREAKDOWN:

TASK	KEY POINTS
1. Select Material	1. Precut studs a. To be straight; ends square b. Sound; good nail holding quality 2. 10d; 16d nails
2. Mark Lines	1. On 1st stud 2. Both sides 3. 1½" from same edge 4. Full length of stud <u>Note:</u> Chalkline may be used
3. Start Nails	1. In 2nd and 3rd stud 2. On one face 3. Approximately 1" from edge 4. Approximately 4" from end - 16" apart 5. Straight and vertical
4. Position 1st Stud	1. Flat - one face up 2. On sturdy base for nailing
5. Position 2nd Stud	1. Flat on 1st stud 2. Nailed edge to marked line 3. 1½" dimension of stud #1 exposed 4. Ends of studs flush
6. Secure 2nd Stud	1. Hold in place 2. Spike nails to stud #1 3. Each end first 4. Then middle
7. Position And Secure 3rd Stud	1. Turn nailed assembly over and position as in step #4 2. Position 3rd stud on opposite side as with 2nd stud, step #5 3. Secure 3rd stud similarly as with 2nd stud, step #6

INSTRUCTOR'S PLAN
MANIPULATIVE LESSON

IV-B-2(S)

TASK: Construct Partition "T"

AIM: The student will be able to select the proper materials and build a partition "T" for a frame wall according to good construction practice.

TOOLS AND EQUIPMENT: Claw hammer (14-16 oz.), nail apron, safety glasses, sawhorses (optional)

MATERIALS: 2 x 3 studs (precut), 2 x 4 shorts (16"-24" lg.), 12d and/or 16d nails

TEACHING AIDS: (See materials, tools and equipment)

REFERENCES: Modern Carpentry, Unit 8, pp. 135-155

PREREQUISITE EXPERIENCE OF THE LEARNER: Student must be familiar with safety involved in stooping, lifting, and nailing. Student must be strong enough to lift and turn assembled "T"s

CHECKING STANDARDS:

1. Accuracy in selection of materials
2. Accuracy in placement of materials
3. Accuracy in nailing

I. PREPARATION (OF THE LEARNER - MOTIVATION)

1. Some parts of a frame wall must be marked and cut, then nailed into position
2. Some parts such as studs may be purchased pre-cut
3. Some parts such as the plates must be measured, cut, put into place, and then many other markings made on them
4. This assembly does not even have to be marked or cut
5. Select four straight pre-cut 2 x 4 studs and six 2 x 4 shorts pieces 16" to 24" long and properly nail them together to form a partition "T"
6. Use three studs and three blocks for a single "T", four studs and six blocks for a double "T"

Be accurate in all procedures
Wear safety glasses

II. PRESENTATION (OF THE SKILLS)

STEPS	KEY POINTS (THINGS TO REMEMBER TO DO OR SAY)
1. Construct Single Partition "T"	<u>Note:</u> This "T" is used where a wall ends with the juncture of another wall
A. Select Material	1. (3) 2 x 4 studs (precut) a. Straight; ends square b. Good nail holding quality 2. (3) 2 x 4 shorts (16"-24" lg.) a. Clear; sound b. Good nail holding quality

- | | |
|-----------------------------------|---|
| | 3. 12d and 16d common nails |
| B. Position 1st Stud | 1. Flat - one face up
2. On a sturdy base for nailing |
| C. Position Blocks | 1. Flat - on 1st stud
2. (1) block each end of stud
3. (1) block in middle of stud
4. Sides, ends flush with stud |
| D. Start 12d Nails | 1. (4) in each block
2. Start 4" from end of block
3. Stagger 1" from side to side
4. Space equally |
| E. Check Alignment | 1. Of blocks on stud
2. As per step #C above |
| F. Spike Blocks To Studs | 1. While holding in place
2. Straight and vertical |
| G. Reposition Nailed Assembly | 1. On its side
2. Edge of blocks, 1st stud up
3. Place on sturdy base for nailing |
| H. Position 2nd Stud | 1. Flat on blocks of nailed assembly
2. Edge of stud in line with joint between blocks and 1st stud
3. Ends of stud flush with ends of assembly |
| I. Start Nails In 2nd Stud | 1. Use 12d or 16d nails
2. (3) nails over each block
3. Spaced 6"-8" apart
4. Center over 1½" width of edge of block
5. Straight and vertical |
| J. Recheck Alignment | 1. Of 2nd stud with nailed assembly
2. As per step #H above |
| K. Spike Stud To Assembly | 1. While holding in place
2. Straight and vertical |
| L. Turn Assembly Over | 1. Stud #2 on bottom
2. Blocks and stud #1 on top; on edge
3. Place on sturdy base for nailing |
| M. Position 3rd Stud | 1. As per step 1H with 2nd stud |
| N. Start Nails In 3rd Stud | 1. As per step 1I |
| O. Recheck Alignment | 1. As per step 1J |
| P. Spike Stud To Assembly | 1. As per step 1K |
| 2. Construct Double Partition "T" | <u>Note:</u> This "T", not nearly as common as a single partition "T", is used in wall frames where two walls intersect |
| A. Select Material | 1. Similarly as in 1A (this lesson)
2. Increase material quantities to:
a. (4) 2 x 4 studs |

II. PRESENTATION (CON'T.)

IV-B-2(S)

- | | |
|---|--|
| B. Construct Single Partition "T" | b. (6) 2 x 4 shorts
1. As per steps 1B thru 1P (this lesson) |
| C. Assemble Additional Blocks To 4th Stud | 1. As per steps 1B thru 1F (this lesson) |
| D. Position Single "T" | 1. On its side
a. Stud #2 or #3 on bottom - flat
b. Stud #1 and blocks on edge
2. On a sturdy base for nailing |
| E. Position 4th Stud To "T" | 1. To open side of "T"
2. With nailed blocks to inside (between studs #2 and #3)
3. Edges of stud aligned with edges of studs #2 and #3
4. Ends of stud even with ends of "T" |
| F. Start Nails | 1. In top stud of "T" (lying flat)
2. (3) nails over each block
3. Space 6"-8" apart
4. Straight and vertical
5. Centered over width of edge of blocks |
| G. Recheck Alignment | 1. Of 4th stud
2. As per step 2E above |
| H. Spike Nails | 1. To 4th stud
2. While holding in place
3. Straight and vertical |
| I. Turn Partition Assembly Over | 1. Position as in step 2D above |
| J. Nail Opposite Side Of 4th Stud | 1. As in steps 2F, 2G, 2H above |

III. APPLICATION (PRACTICE BY LEARNER UNDER CLOSE SUPERVISION)

Note: Provide student with job and task sheets

Students construct partition "T" using job and task sheets

IV. VERIFICATION AND/OR EVALUATION (CHECK ON STUDENT'S ABILITY)

Performance test

Put students on their own to construct partition "T"

V. SUMMARY (TELL THE STEPS ON PROCEDURE AS TO WHAT, HOW, AND WHY. REVIEW CHECKING STANDARDS. THIS SUMMARY MAY BE GIVEN AT ANY PLACE IN THE LESSON THE TEACHER FEELS WILL BE PROFITABLE TO THE STUDENTS.)

Review steps in constructing single partition "T"

Review steps in constructing double partition "T"

SUGGESTED READING FOR THE STUDENT:

Modern Carpentry, Unit 8, pp. 135-155

THE NEXT LESSON IS: IV-C-1(S) "Construct and Install Solid Header"

JOB SHEET
IN
FRAMING

IV-B-2(J)

JOB: Construct Partition "T"s

MATERIALS: 2 x 4 studs (precut), 2 x 4 shorts (16"-24" lg.), 12d and 16d nails

TOOLS AND EQUIPMENT: Claw hammer (14-16 oz.), nail apron, safety glasses, saw-horse (optional)

GENERAL INSTRUCTIONS: Read references: Textbook, Modern Carpentry, Unit 8, pp. 135-155; Library Reference: Carpentry for the Building Trades, Lair, pp. 64-65

PROCEDURES AND/OR TASKS: IV-B-2(TS) Construct Single Partition "T"s
IV-B-2a(TS) Construct Double Partition "T"s

TASK SHEET

IV-B-2(TS)

TASK: Construct Single Partition "T"
JOB: Construct Partition "T"s
TRADE: Building Trades
TOOLS AND MATERIALS: Claw hammer, (3) pre-cut 2 x 4 studs, (3) 2 x 4 blocks 16" to 24" long, 12d or 16d common nails, safety glasses, work bench

TASK BREAKDOWN:

-
- | | |
|-------------------------------|---|
| 1. Select Material | 1. (3) 2 x 4 studs (precut)
a. Straight; ends square
b. Good nail holding quality
2. (3) 2 x 4 shorts (16"-24" lg.)
a. Clear; sound; ends square
b. Good nail holding quality
3. 12d and 16d common nails |
| 2. Position 1st Stud | 1. Flat - one face up
2. On a sturdy base for nailing |
| 3. Position Blocks | 1. Flat - on 1st stud
2. (1) block each end of stud
3. (1) block in middle of stud
4. Sides, ends flush with stud |
| 4. Start 12d Nails | 1. (4) in each block
2. Start 4" from end of block
3. Stagger 1" from side to side
4. Space equally
5. Start straight and vertical |
| 5. Check Alignment | 1. Of blocks on stud
2. As per step #3 above |
| 6. Spike Blocks To Stud | 1. While holding in place
2. Straight and vertical |
| 7. Reposition Nailed Assembly | 1. On its side
2. Edge of blocks; 1st stud up
3. Place on sturdy base for nailing |
| 8. Position 2nd Stud | 1. Flat on blocks of nailed assembly
2. Edge of stud in line with joint between blocks and 1st stud
3. Ends of stud flush with ends of assembly |
| 9. Start Nails In 2nd Stud | 1. Use 12d or 16d nails
2. (3) nails over each block
3. Spaced 6"-8" apart
4. Center over 1½" width of edge of block
5. Straight and vertical |
| 10. Recheck Alignment | 1. Of 2nd stud with nailed assembly
2. As per step #8 above |

STEPS	KEY POINTS
11. Spike Stud To Assembly	1. While holding in place 2. Straight and vertical
12. Turn Assembly Over	1. Stud #2 on bottom 2. Blocks and stud #1 on top; on edge 3. Place on sturdy base for nailing
13. Position 3rd Stud	1. As per step #8 with 2nd stud
14. Start Nails In 3rd Stud	1. As per step #9
15. Recheck Alignment	1. As per step #10
16. Spike Stud To Assembly	1. As per step #11

TASK SHEET

IV-B-2a(TS)

TASK: Construct Double Partition "T"
 JOB: Construct Partition "T"s
 TRADE: Building Trades
 TOOLS AND MATERIALS: Claw hammer (14-16 oz.), nail apron, safety glasses, (4) 2 x 4 studs (precut), (6) 2 x 4 shorts (16"-24" lg.), 12d and 16d nails

TASK BREAKDOWN:

STEPS	KEY POINTS
1. Select Material	1. (4) 2 x 4 studs (precut) a. Straight; ends square b. Good nail holding quality 2. (6) 2 x 4 shorts (16"-24" lg.) a. Clear; sound; ends square b. Good nail holding quality 3. 12d and 16d nails
2. Construct Single Partition "T"	1. As per task sheet IV-B-2(TS)
3. Assemble Additional Blocks To 4th Stud	1. As per steps #2 thru #5, task sheet IV-B-2(TS)
4. Position 4th Stud To "T"	1. To open side of "T" 2. With nailed blocks to inside (between studs #2 and #3) 3. Edges of stud aligned with edges of studs #2 and #3 4. Ends of stud even with ends of "T"
5. Start Nails	1. In top stud of "T" (lying flat) 2. (3) nails over each block 3. Space 6"-8" apart 4. Straight and vertical 5. Centered over width of edge of blocks
6. Recheck Alignment	1. Of 4th stud 2. As per step #4 above
7. Spike Nails	1. To 4th stud 2. While holding in place 3. Straight and vertical
8. Turn Partition Assembly Over	1. Stud #2 or #3 on bottom 2. Flat on a sturdy base for nailing
9. Nail Opposite Side	1. As in steps #5, #6, #7 above